

Public Health Literacy

As a distinctive field of Research

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**“Understanding
is a two-way street.”**

Eleanor Roosevelt

Health literacy is a powerful social determinant of health. Health literacy as a theory of behavior change can produce positive gains in individual, community, and global health.- Andrew Pleasant

<https://doi.org/10.1002/ace.409>

COVID 19

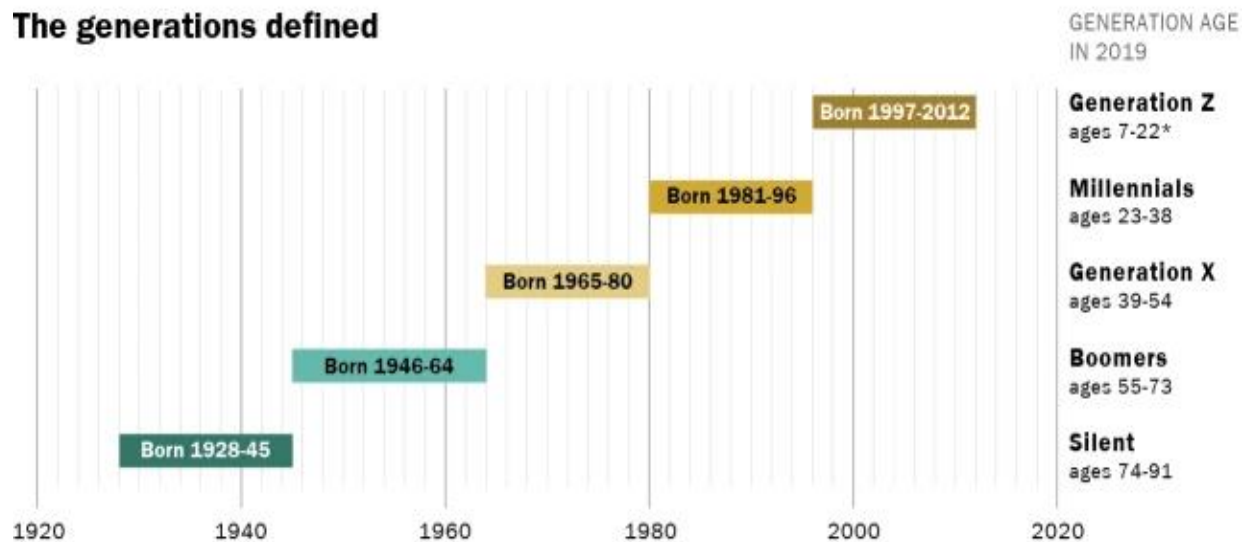
- something strange about COVID 19 pandemic
- Despite over 63,000 publications on COVID, none can explain the scale and variability of the disease.
- May R0 (r-naught)– measure of contagiousness.
- Dashboards, predictive models, algorithms, Machine learning, and AI are in race to understand and to be accurate
- Super spreaders (19% of cases are responsible for 80% cases. (we do not know much)



- The coronavirus is the greatest management challenge most of us have ever faced, bigger in current living generations

Understanding generations- Priorities change, so does significance of the needs

The generations defined



*No chronological endpoint has been set for this group. For this analysis, Generation Z is defined as those ages 7 to 22 in 2019.

PEW RESEARCH CENTER

Modern historic events by generation

Q. Please name the 10 historic events that occurred in YOUR lifetime that you think have had the greatest impact on the country. This could be one specific event, a series of related events or any other historic development or change that had an important impact on the nation.

Millennials			Generation X		
1	Sept. 11	86%	1	Sept. 11	79%
2	Obama election	47	2	Obama election	40
3	Iraq/Afghanistan wars	24	3	Fall of Berlin Wall/end of Cold War	21
4	Gay marriage	19	4	The tech revolution	20
5	The tech revolution	18	5	Iraq/Afghanistan wars	18
6	Orlando shooting	17	6	Gulf War	15
7	Hurricane Katrina	11	7	Challenger disaster	14
8	Columbine shooting	10	8	Gay marriage	10
9	Bin Laden	10	9	Hurricane Katrina	10
10	Sandy Hook	7	10	Columbine shooting	9
11	Boston Marathon bombing	7	11	Orlando shooting	9
12	Great Recession	7	12	Oklahoma City bombing	9

Baby Boomers			Silent Generation		
1	Sept. 11	70%	1	Sept. 11	59%
2	JFK assassination	45	2	WWII	44
3	Vietnam War	41	3	JFK assassination	41
4	Obama election	38	4	Vietnam War	37
5	Moon landing	35	5	Moon landing	29
6	The tech revolution	26	6	Obama election	28
7	Civil rights movement	18	7	The tech revolution	27
8	Fall of Berlin Wall/end of Cold War	16	8	Civil rights movement	18
9	MLK assassination	15	9	Korean War	18
10	Iraq/Afghanistan wars	11	10	Iraq/Afghanistan wars	14

Note: Shown are the top 10 events mentioned, including numerical ties. While events are ranked numerically for ease of reading, not all differences between ranked events are statistically significant. Look to accompanying text to highlight significant differences.

Source: Survey conducted June 16-July 4, 2016.

"Americans Name the 10 Most Significant Historic Events of Their Lifetimes"

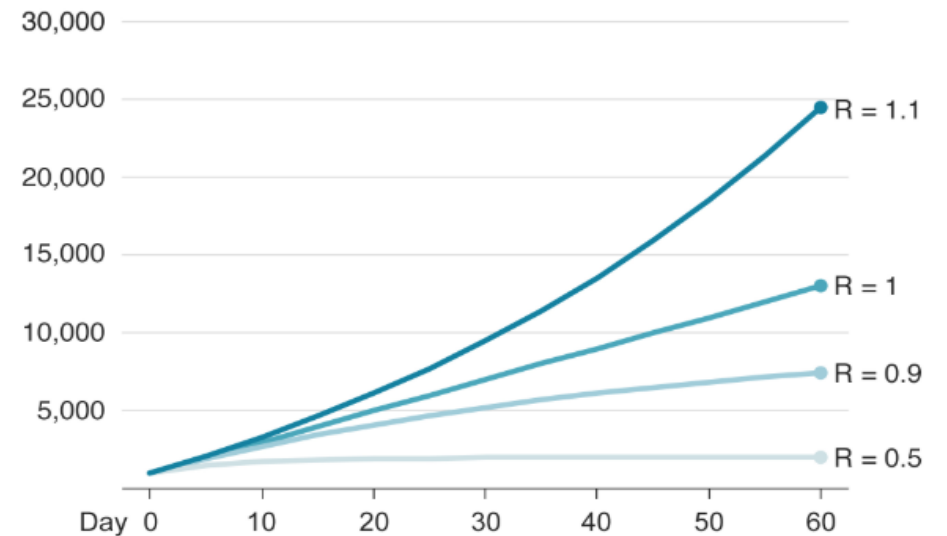
PEW RESEARCH CENTER

R_0 , pronounced “R naught,” is a mathematical term that indicates how contagious an infectious disease is –

➤ If a disease has an R_0 of 1, each person infected will transmit to an average of one person

➤ if a disease has an R_0 of 3, each person infected will transmit it to an average of 3 other people.

How 1,000 cases would increase under different infection rates



	COVID-19	MERS-COV	SARS-COV
Date extracted from	Dec. 2020 - Feb. 2020	Sept. 2012	Dec. 2003
Place of origin	Wuhan, China	Jeddah, Saudi Arabia	Guangdong China
Age range	56 (22-92)	56 (14-94)	39.9 (1-91)
Male/Female sex ratio	1.3:1	3.3:1	1:1.25
Confirmed cases (Global)	24554	2494	8096
R_0	4.7 - 6.6	0.45 - 0.91	0.86 - 1.88
Incubation period (day)	7 - 14	5.0 - 6.9	4.4 - 6.9

Relationship between social distancing and disease spread R_0 of 2.5 - Messaging is critical in public health literacy

THE IMPORTANCE OF
SOCIAL DISTANCING

How a reduction in social contact can reduce the spread of COVID-19

LEARN MORE: www.montana.edu/health/coronavirus

NORMAL BEHAVIOR

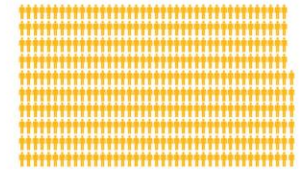


1 PERSON INFECTS



2.5 PEOPLE

IN 5 DAYS



IN 30 DAYS

406 PEOPLE

50% LESS CONTACT



1 PERSON INFECTS



1.25 PEOPLE

IN 5 DAYS



IN 30 DAYS

15 PEOPLE

75% LESS CONTACT



1 PERSON INFECTS



.625 PEOPLE

IN 5 DAYS



IN 30 DAYS

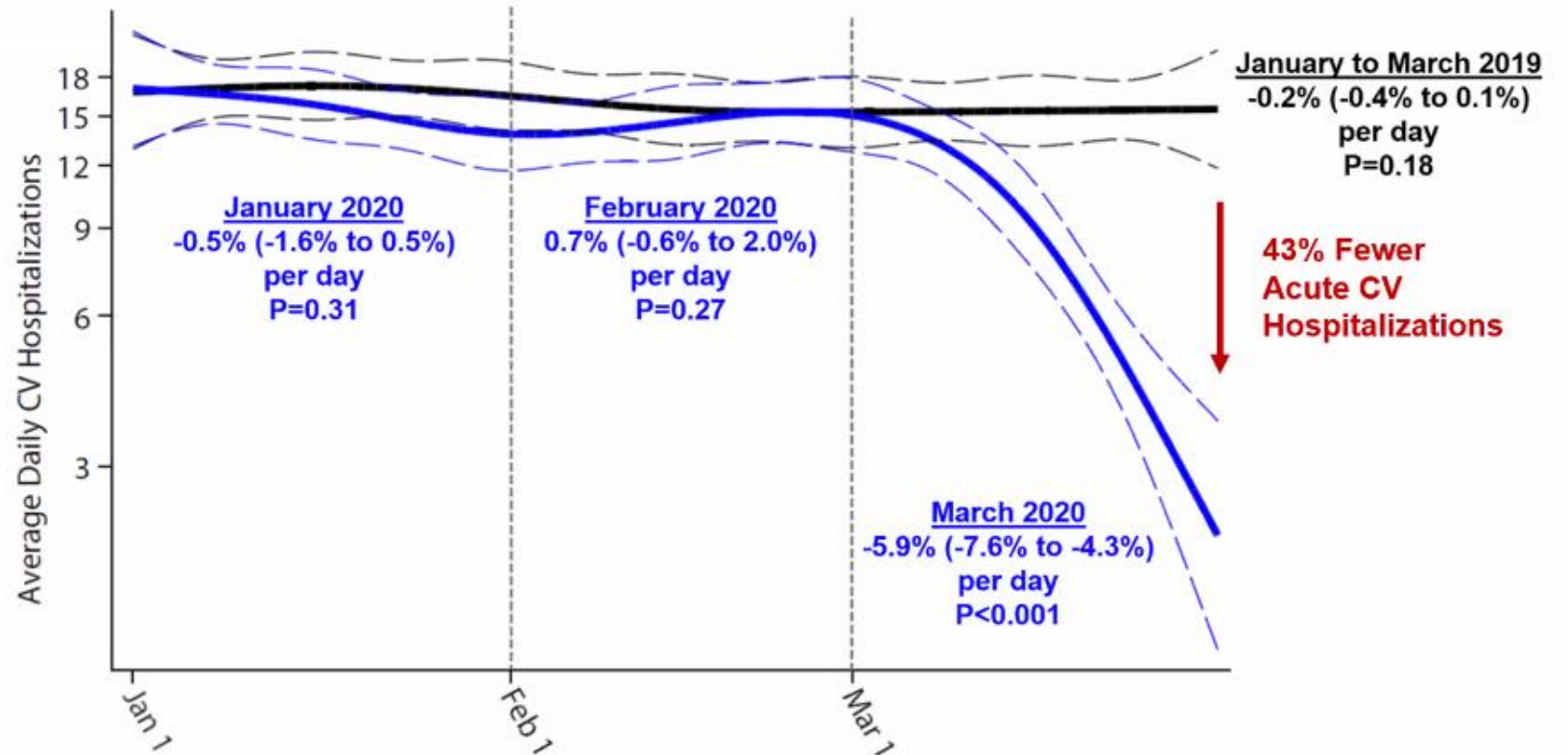
2.5 PEOPLE

Other
diseases

Trend in
reduction of
heart related
hospitalization
during COVID

Partners Health

Global Disruption of Acute CV Care: Mass General Brigham Experience



JACC
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

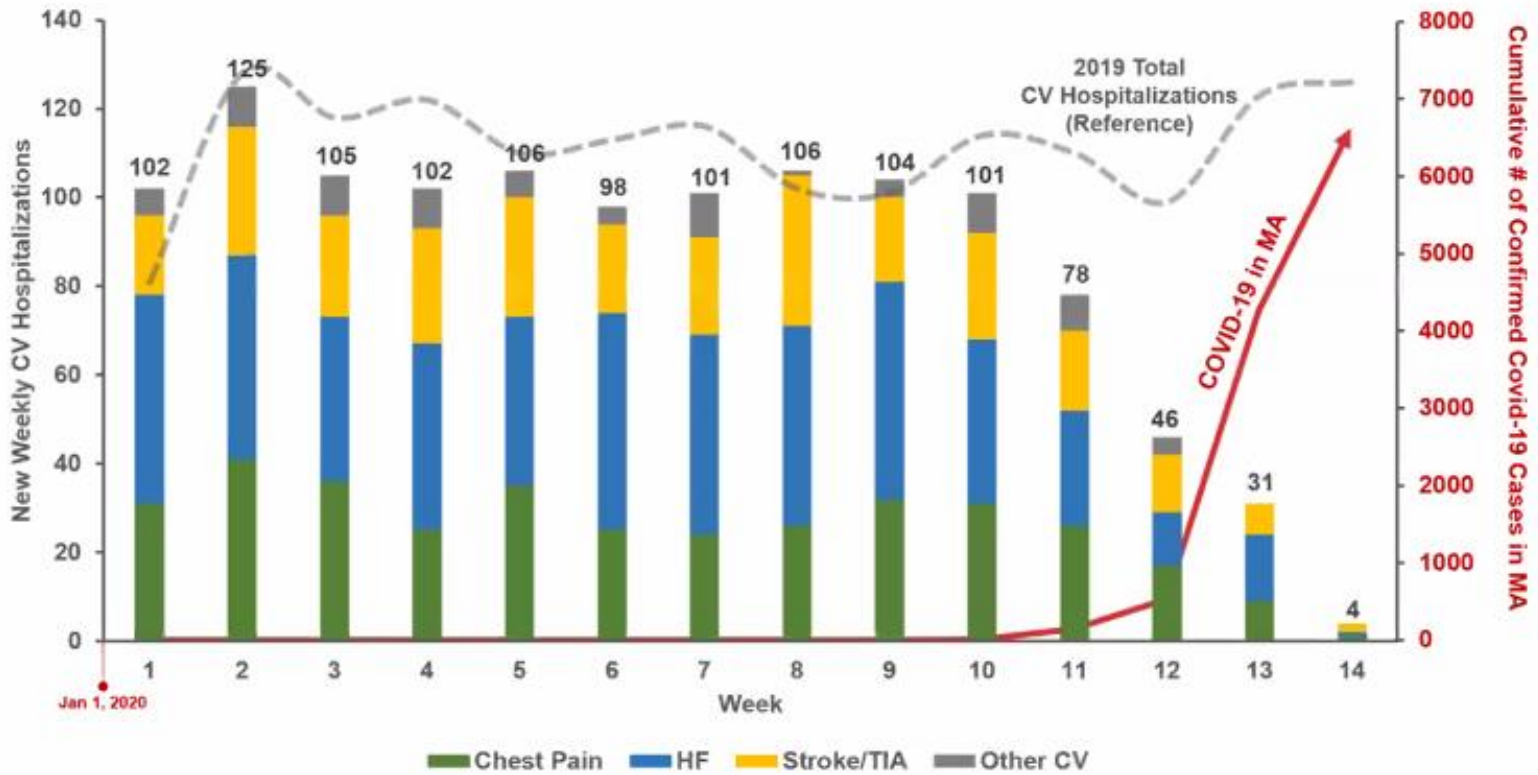
Bhatt AS, Moscone A, McElrath EE, Varshney AS, Claggett BL, Bhatt DL, Januzzi JL, Butler J, Adler DS, Solomon SD, Vaduganathan M. 2020 [Epub Ahead of Print]



“Missing” Patients with Acute MI, Stroke, and HF During the Pandemic

Trend in reduction of heart related hospitalization during COVID

Massachusetts



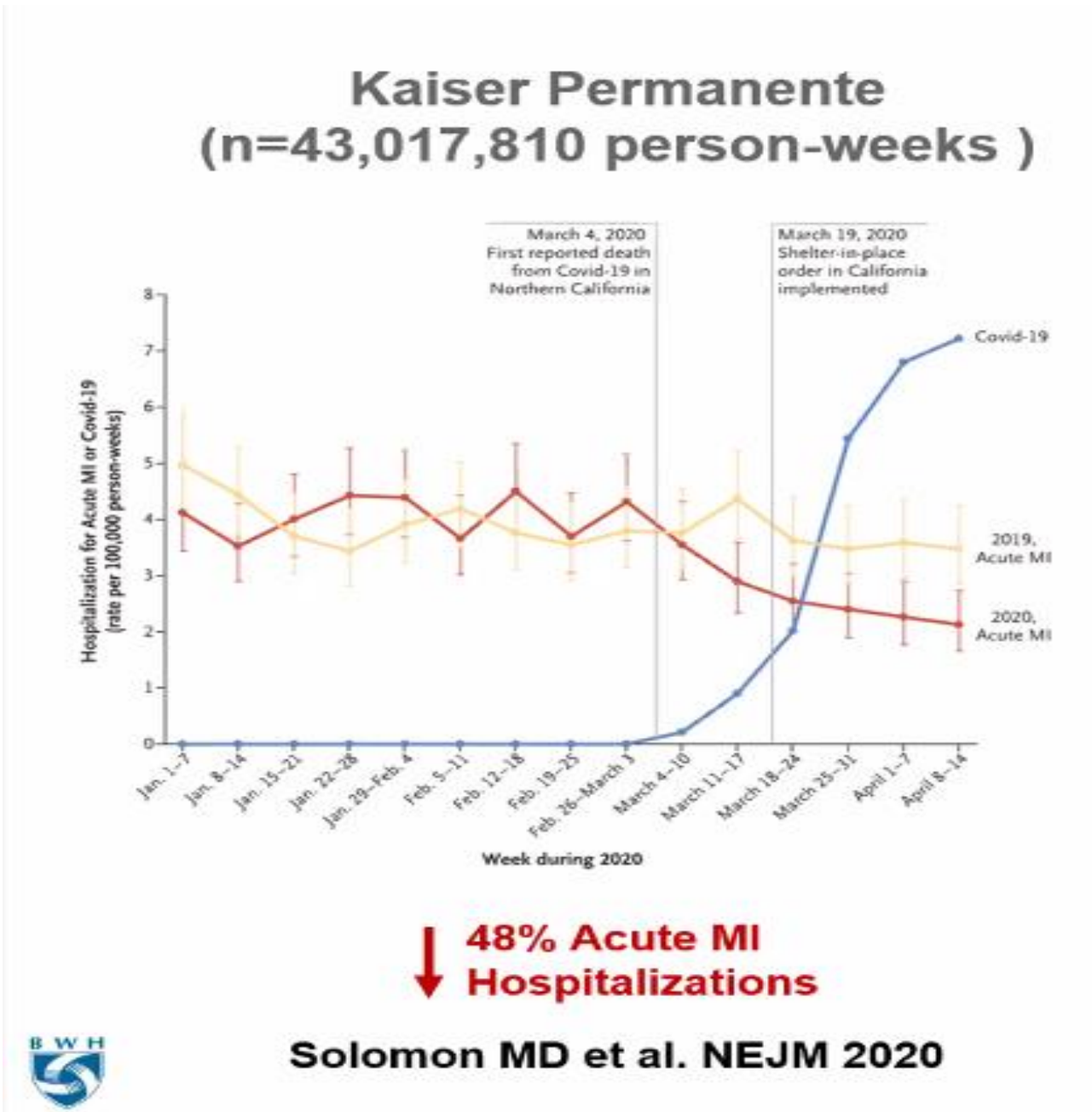
JACC
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Bhatt AS, Moscone A, McElrath EE, Varshney AS, Claggett BL, Bhatt DL, Januzzi JL, Butler J, Adler DS, Solomon SD, Vaduganathan M. 2020 [Epub Ahead of Print]



Trend in reduction of Acute MI related hospitalization during COVID

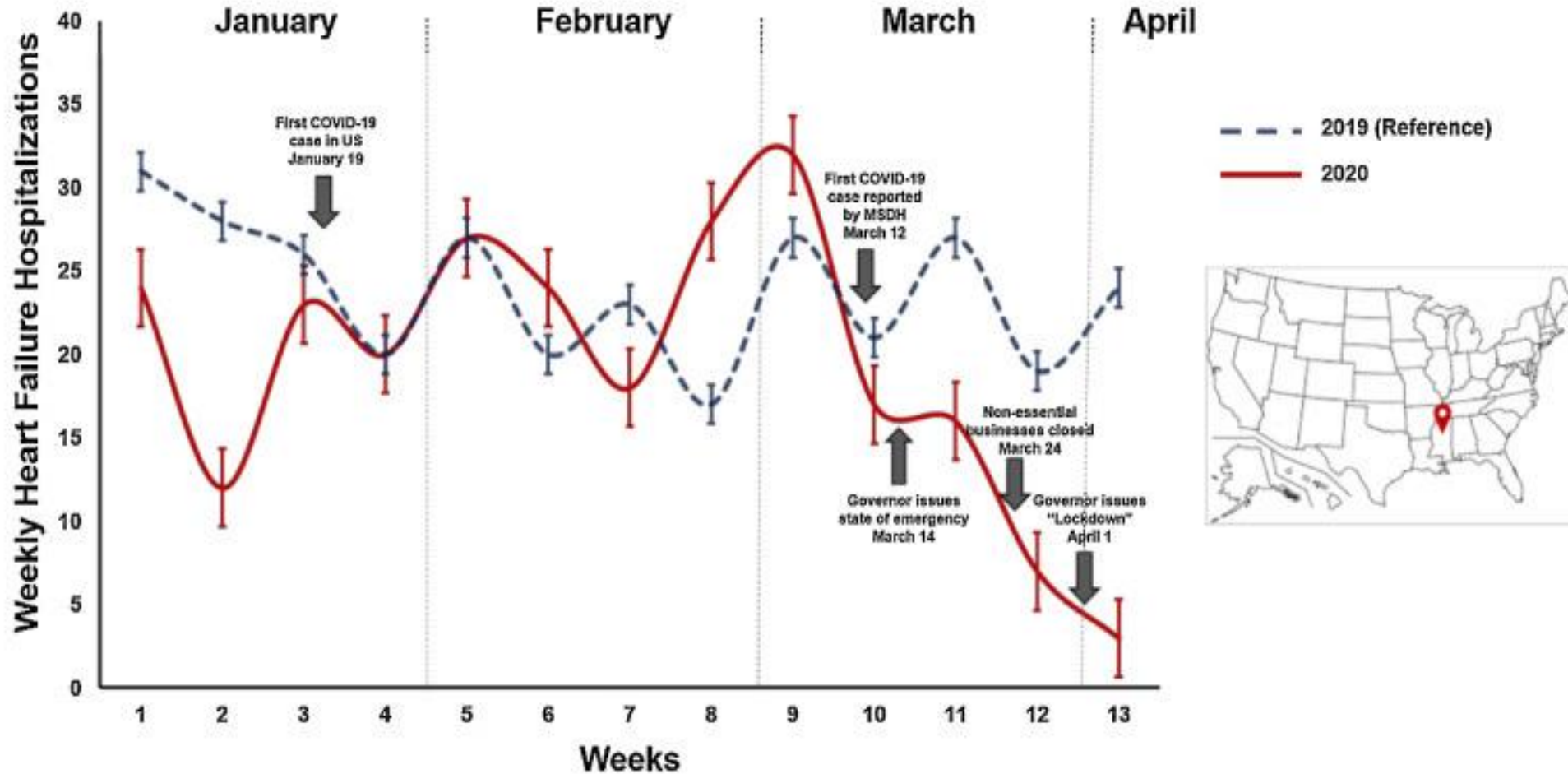
California



Trend in reduction of heart related hospitalization during COVID

Mississippi

Decline in Heart Failure Hospitalizations During the COVID-19 Pandemic



Trends of heart failure hospitalizations at the University of Mississippi Medical Center from January through April 11, 2020 (red line) and the same time window in 2019

Public Health Literacy 101 during COVID 19

Individual level:

- Personal protection
- Hand washing
- Social distancing

Institutional level:

- Capacity preservation
- Protective devices
- Contact tracing
- Care of NCD and other communicable diseases
- strategic preparation

Importance of hand wash – Messaging, key marker of PHL

Where Have **Your** Hands Been?



Not all surfaces are created equal

Persistence of Coronaviruses on Surfaces



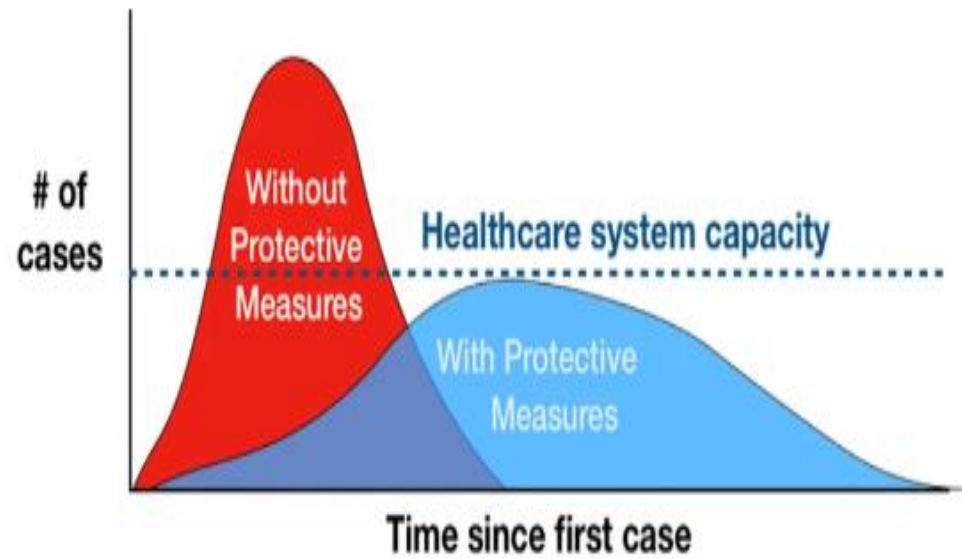
Source: *J. Hosp. Infect.* DOI: <https://doi.org/10.1016/j.jhin.2020.01.022>

Note: Coronavirus activity may be impacted by temperatures higher than 86°F (30°C). Authors also confirm that coronavirus may be effectively wiped away by household disinfectants. COVID-19 was NOT included in this study

Medscape

Institutional Level: Capacity preservation

Similar outcomes both protective measures and public health measures



Adapted from CDC / The Economist

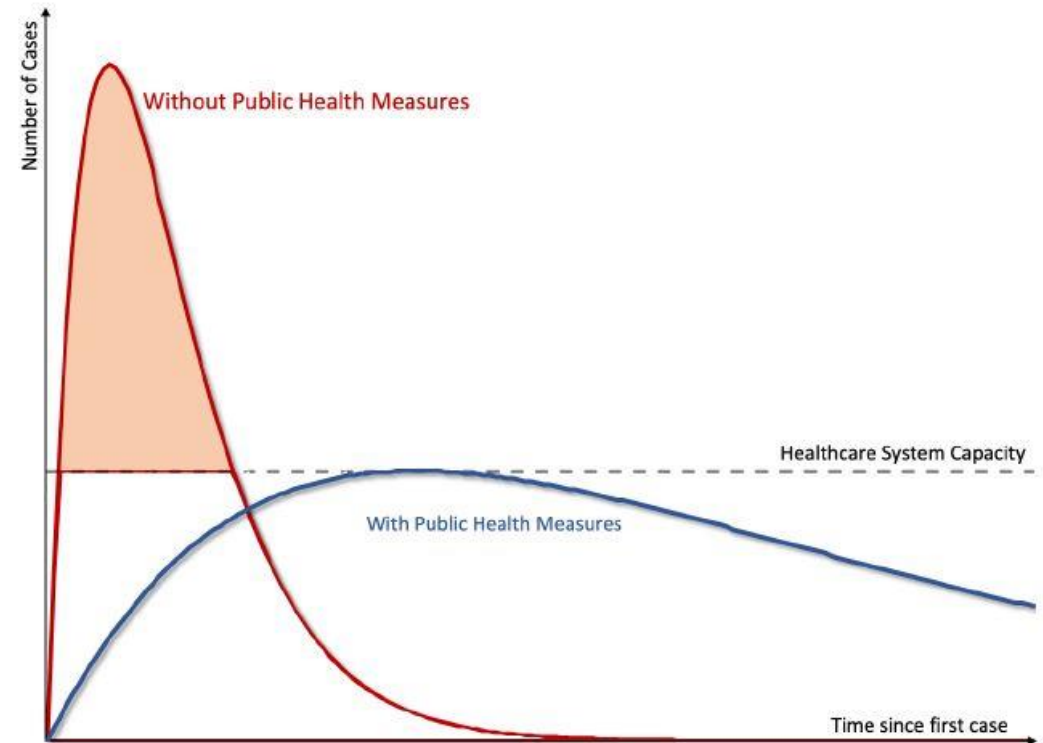


Figure 1: Flattening the Pandemic Curve

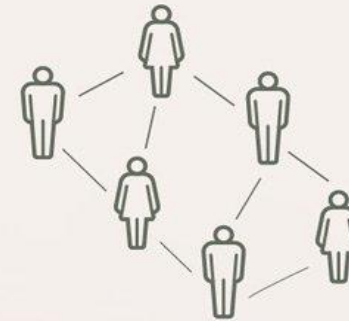
Social distancing is the key during pandemic, can we accomplish this in India?

SOCIAL DISTANCING

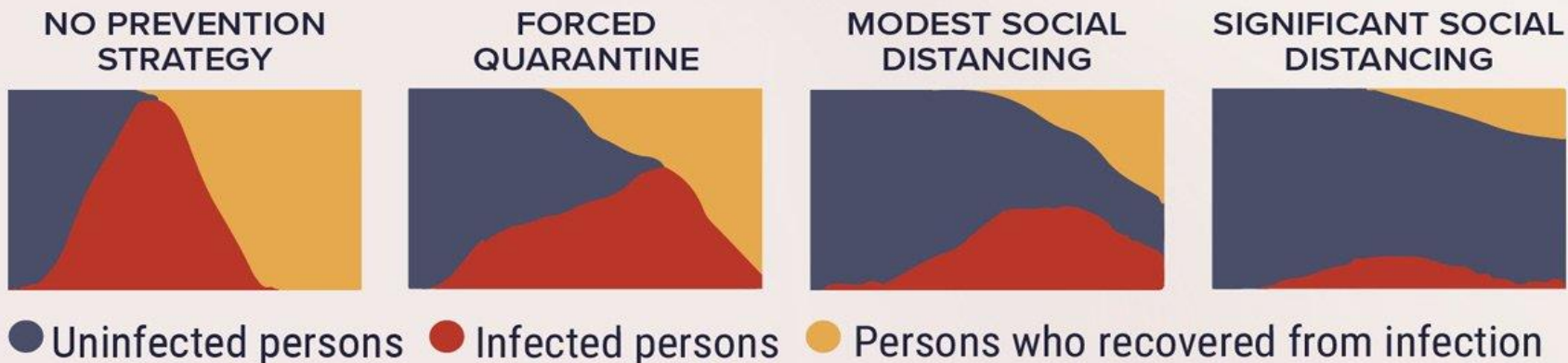
Medscape

KEY RECOMMENDATIONS INCLUDE:

- Stay home if you are **sick, older**, have an **underlying health condition**, or someone in the household **tested positive for COVID-19**
- No gatherings of **> 10 people**
- Stay **≥ 6 feet away** from others
- **Avoid** travel, shopping trips, and social visits



The Washington Post published results of simulated social distancing strategies.

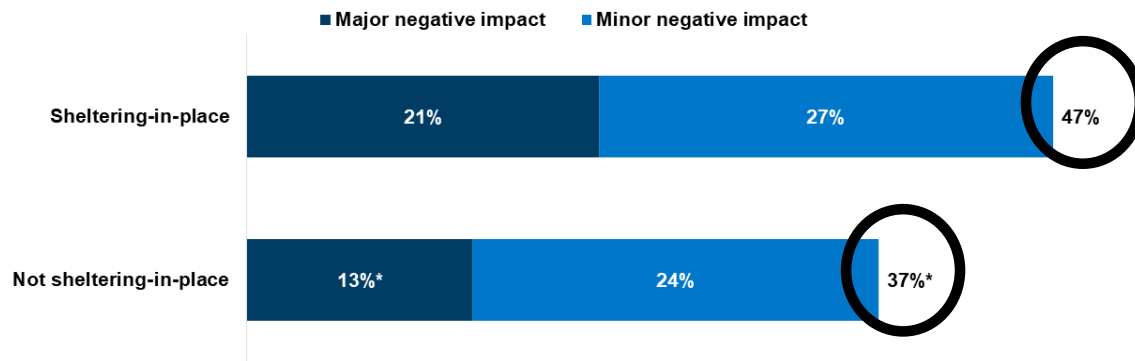


Negative impact from the interventions – Individual level

Lock-down effect on mental health

Figure 1

Percent of Adults Who Say Worry or Stress Related to the Coronavirus Has Had a Negative Impact on Their Mental Health, Based on Sheltering-in-Place Status



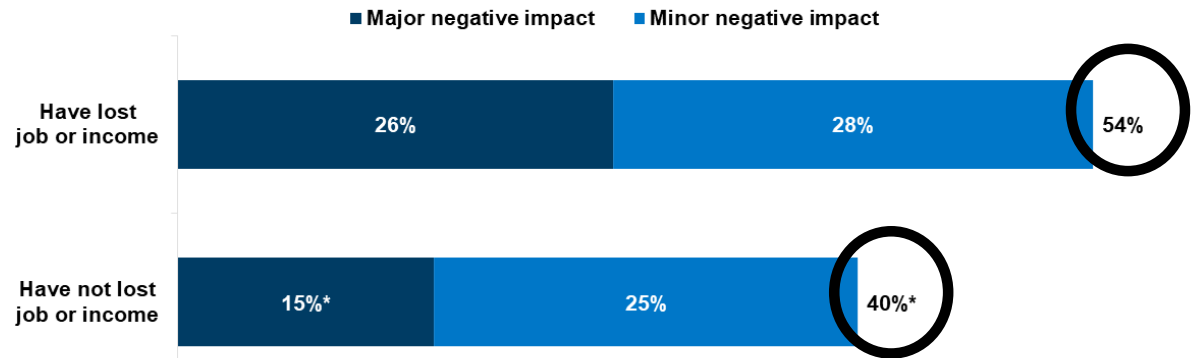
NOTES: *Indicates a statistically significant difference between those sheltering-in-place and those not sheltering-in-place at the $p < 0.05$ level. Distribution may not sum to total due to rounding.
SOURCE: KFF Health Tracking Poll (conducted March 25-30, 2020).



Loss of employment on mental health

Figure 3

Percent of Adults Who Say Worry or Stress Related to the Coronavirus Has Had a Negative Impact on Their Mental Health, Based on Job or Income Loss



NOTES: *Indicates a statistically significant difference between those who have lost job or income and those who have not lost job or income at the $p < 0.05$ level.
SOURCE: KFF Health Tracking Poll (conducted March 25-30, 2020).



Negative Impact Institutional level (155 countries survey in May 2020)

COVID-19 significantly impacts health services for noncommunicable diseases

1 June 2020 | News release

➤ Service disruptions are widespread.

- 53% of the countries surveyed have disrupted services for hypertension treatment;
- 49% of the countries for treatment for diabetes and diabetes-related complications;
- 42% of the countries for cancer treatment, and
- 31% for cardiovascular emergencies.
- 63% of countries for Rehabilitation services even though rehabilitation is key to a healthy recovery following severe illness from COVID-19.

➤ Reassignment of staff and postponing of screening

- 94% of countries responding, ministry of health staff working in the area of NCDs were reassigned to support COVID-19.
- 50% of the countries have postponed public screening programs (for example for breast and cervical cancer)

What we do not know fully is relationship between COVID and genotype of an individual

- The genes of thousands of patients in Europe found that those who had Type “A” blood were more likely to have severe disease while those with Type “O” were less likely

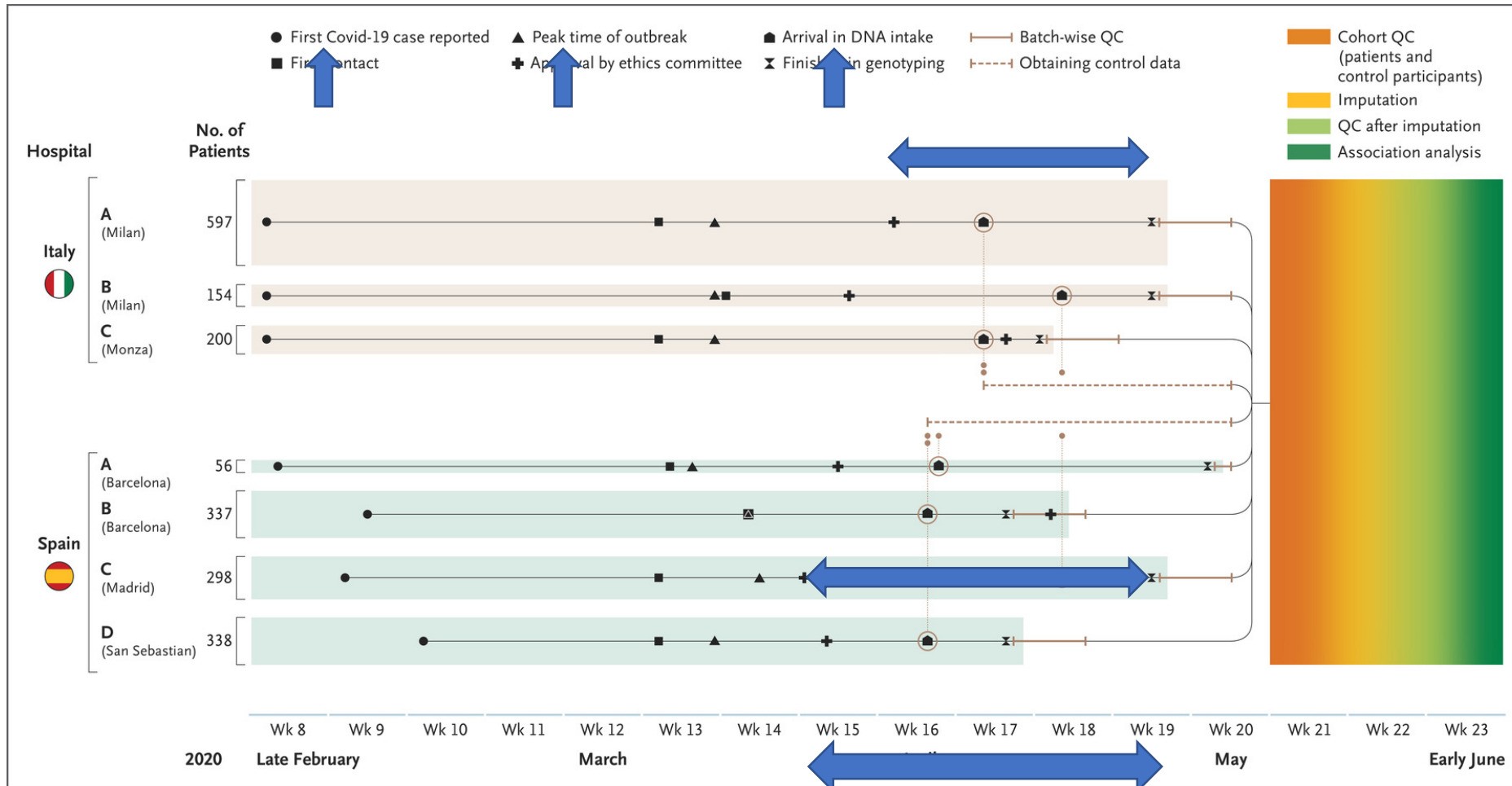
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Genomewide Association Study of Severe Covid-19 with Respiratory Failure

The Severe Covid-19 GWAS Group*

We have a lot of data on phenotype relationship, but not much on genotype relationship



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Genomewide Association Study of Severe Covid-19 with Respiratory Failure

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What is unknown?



- How do we control animal/intermediary host?
- What is the true case count (mild symptoms/asymptomatic carriers) and lethality?
- What comorbidities are associated with severe disease outcome and how do these affect viral pathogenesis?
- When will be the next coronavirus to enter the human population?

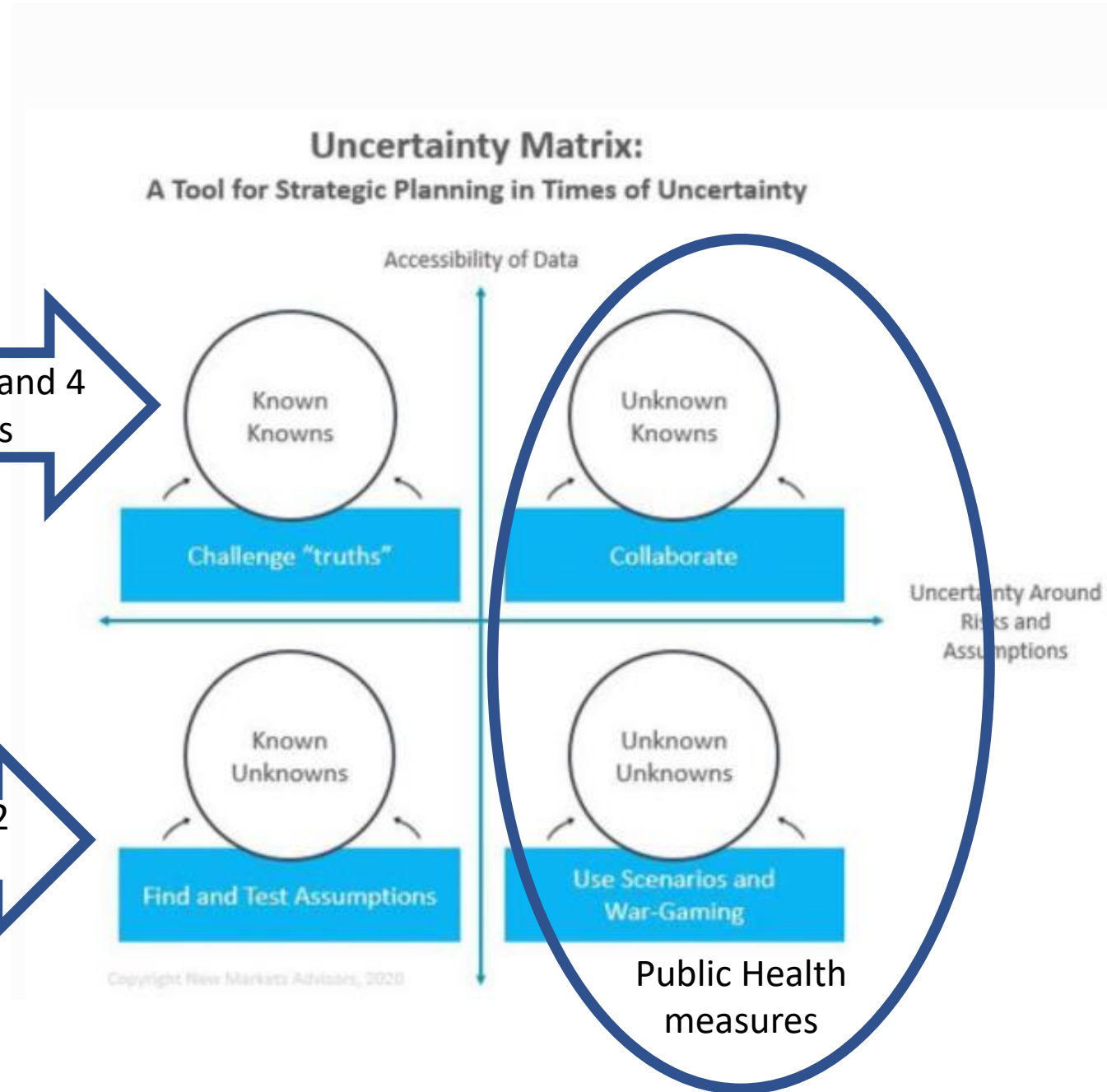
The past 18 years have seen the emergence of three novel coronaviruses that have caused significant morbidity and mortality in the human population.

Effects of Unknowns: Role of Public Health

- There are known knowns there are things we know we know.
- We also know there are known unknowns; that is to say we know there are some things we do not know.
- But there are also unknown unknowns—the ones we don't know we don't know.
- Former U.S. Secretary of Defense Donald Rumsfeld

Phase 3 and 4 trials

Phase 1 and 2 trials



REFRAMING HEALTH LITERACY AS A PUBLIC HEALTH ISSUE

Chloe E. Bird, Ph.D.
The RAND Corporation

There is revived
interest in public
health literacy
globally



HARVARD
T.H. CHAN

SCHOOL OF PUBLIC HEALTH

ABOUT

FACULTY & RESEARCH

ADMISSIONS & AID

Health Literacy Studies

Tufts SCHOOL OF MEDICINE

Health Literacy Leadership

Online Course Summer 2020

May 26 - June 25, Tuesdays & Thursdays, 9:00 - 12:00 (EST)



College of Education & Human Development

Health Literacy Graduate Certificate

Evidence

- Systematic analysis of 175 countries between 1970 and 2009 found that more than half of the recent reductions in child deaths are linked to gains in women's educational attainment (Gakidou et al., 2010).
- Another study showed that health education has a positive impact on an entire community's well-being, not just on a child's health (Basu and Stephenson, 2005)

What Is Health Literacy?

- **Health literacy** is the degree to which individuals have the capacity to ***obtain, process,*** and ***understand*** basic health information and services needed to make appropriate health decisions.
- Health literacy is dependent on both individual and systemic factors:
 1. Communication skills of lay people and professionals
 2. Knowledge of lay people and professionals of health topics
 3. Culture
 4. Demands of the healthcare and public health systems
 5. Demands of the situation/context

<http://www.health.gov/communication/literacy/>

Emerging domain

- Health literacy is a term introduced in the 1970s.
- Its importance in public health and healthcare.
- It is concerned with the capacities of people to meet the complex demands of health in a modern society

Table 1 Definitions of health literacy

1	WHO (1998)	"The cognitive and social skills which determine the motivation and ability of individuals to gain access to understand and use information in ways which promote and maintain good health" [31]
2	American Medical Association's (1999)	"The constellation of skills, including the ability to perform basic reading and numeral tasks required to function in the healthcare environment" [12]
3	Nutbeam (2000)	"The personal, cognitive and social skills which determine the ability of individuals to gain access to, understand, and use information to promote and maintain good health" [36]
4	Institute of Medicine (2004)	"The individuals' capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions" [8]
5	Kickbusch, Wait & Maag (2005)	"The ability to make sound health decision(s) in the context of everyday life--at home, in the community, at the workplace, the healthcare system, the market place and the political arena. It is a critical empowerment strategy to increase people's control over their health, their ability to seek out information and their ability to take responsibility" [37]
6	Zarcadoolas, Pleasant & Greer (2003, 2005, 2006)	"The wide range of skills, and competencies that people develop to seek out, comprehend, evaluate and use health information and concepts to make informed choices, reduce health risks and increase quality of life" [34,38,39]
7	Paasche-Orlow & Wolf (2006)	"An individual's possession of requisite skills for making health-related decisions, which means that health literacy must always be examined in the context of the specific tasks that need to be accomplished. The importance of a contextual appreciation of health literacy must be underscored" [40]
8	EU (2007)	"The ability to read, filter and understand health information in order to form sound judgments" [30]
9	Pavlekovic (2008)	"The capacity to obtain, interpret and understand basic health information and services and the competence to use such information to enhance health" [41]
10	Rootman & Gordon-Elbihbety (2008)	"The ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life course" [42]
11	Ishikawa & Yano (2008)	"The knowledge, skills and abilities that pertain to interactions with the healthcare system" [14]
12	Mancuso (2008)	"A process that evolves over one's lifetime and encompasses the attributes of capacity, comprehension, and communication. The attributes of health literacy are integrated within and preceded by the skills, strategies, and abilities embedded within the competencies needed to attain health literacy" [43]
13	Australian Bureau of Statistics (2008)	"The knowledge and skills required to understand and use information relating to health issues such as drugs and alcohol, disease prevention and treatment, safety and accident prevention, first aid, emergencies, and staying healthy" [44]
14	Yost et al. (2009)	"The degree to which individuals have the capacity to read and comprehend health-related print material, identify and interpret information presented in graphical format (charts, graphs and tables), and perform arithmetic operations in order to make appropriate health and care decisions" [45]
15	Adams et al. (2009)	"The ability to understand and interpret the meaning of health information in written, spoken or digital form and how this motivates people to embrace or disregard actions relating to health" [22]
16	Adkins et al. (2009)	"The ability to derive meaning from different forms of communication by using a variety of skills to accomplish health-related objectives" [46]
17	Freedman et al. (2009)	"The degree to which individuals and groups can obtain process, understand, evaluate, and act upon information needed to make public health decisions that benefit the community" [35]

Conceptual model of Health Literacy



Sørensen et al., Health literacy and public health: A systematic review and integration of definitions and models. *BMC Public Health*. 2012;12:80

Cuts across three main health domains @ Consumer level

Sørensen *et al.* *BMC Public Health* 2012, **12**:80
<http://www.biomedcentral.com/1471-2458/12/80>

Page 10 of 13

Table 4 The matrix with four dimensions of health literacy applied to three health domains

	Access/obtain information relevant to health	Understand information relevant to health	Process/appraise information relevant to health	Apply/use information relevant to health
Health care	Ability to access information on medical or clinical issues	Ability to understand medical information and derive meaning	Ability to interpret and evaluate medical information	Ability to make informed decisions on medical issues
Disease prevention	Ability to access information on risk factors for health	Ability to understand information on risk factors and derive meaning	Ability to interpret and evaluate information on risk factors for health	Ability to make informed decisions on risk factors for health
Health promotion	Ability to update oneself on determinants of health in the social and physical environment	Ability to understand information on determinants of health in the social and physical environment and derive meaning	Ability to interpret and evaluate information on health determinants in the social and physical environment	Ability to make informed decisions on health determinants in the social and physical environment

@ providers' level

DOMAIN		BEHAVIORS			N/A	
1	Allows patient to tell story without unnecessary interruption	Stops open-ended questioning very early OR Frequently interrupts	Stops open-ended questioning prematurely OR Noticeable interruption	Allows adequate open-ended questioning; Minimal interruption	Cultivates complete patient statement through open-ended questioning; No unnecessary interruption	
2	Questions demonstrate listening and attentiveness	Many questions are inappropriately repetitive or ignore interview context	Some questions are inappropriately repetitive or ignore interview context	Questions are not inappropriately repetitive, generally fit interview context	Questions are not inappropriately repetitive, reflect insightful response to context of interview	
3	Facilitates patient expression as appropriate	<u>No or inappropriate:</u> prompting of patient OR attempts to guide interview	<u>Ineffective:</u> prompting of patient OR attempts to guide interview	<u>Effective:</u> prompting of patient OR attempts to guide interview	<u>Tailored, calibrated:</u> prompting of patient OR attempts to guide interview	
4	Treats patient with respect	One or more responses would appear disrespectful to most patients	One or more responses could be interpreted as disrespectful	Consistently shows respect for patient	Clearly displays a high level of respect OR dealt respectfully with difficult subject	
5	Explores patient's perspective of health concern	No or minimal effort at understanding patient's perspective	Asks few or superficial questions about patient's perspective	Adequately explores patient's perspective	Develops full understanding of patient's perspective	
6	Uses language patients can understand	Uses some language which would be unclear to most patients	Uses some language which may be unclear to many patients	Consistently uses plain language	Consistently uses plain language, checks understanding as needed	
7	Student non-verbals communicate respect & interest	Some non-verbals communicate disinterest or disrespect	Some non-verbals could be interpreted as disinterest or disrespect	Non-verbals communicate respect/interest	Non-verbals communicate respect/interest, are adapted to specific moments of interview	

FIGURE 5-1 The Communications Assessment Tool used by the GRU/UGA Medical Partnership.

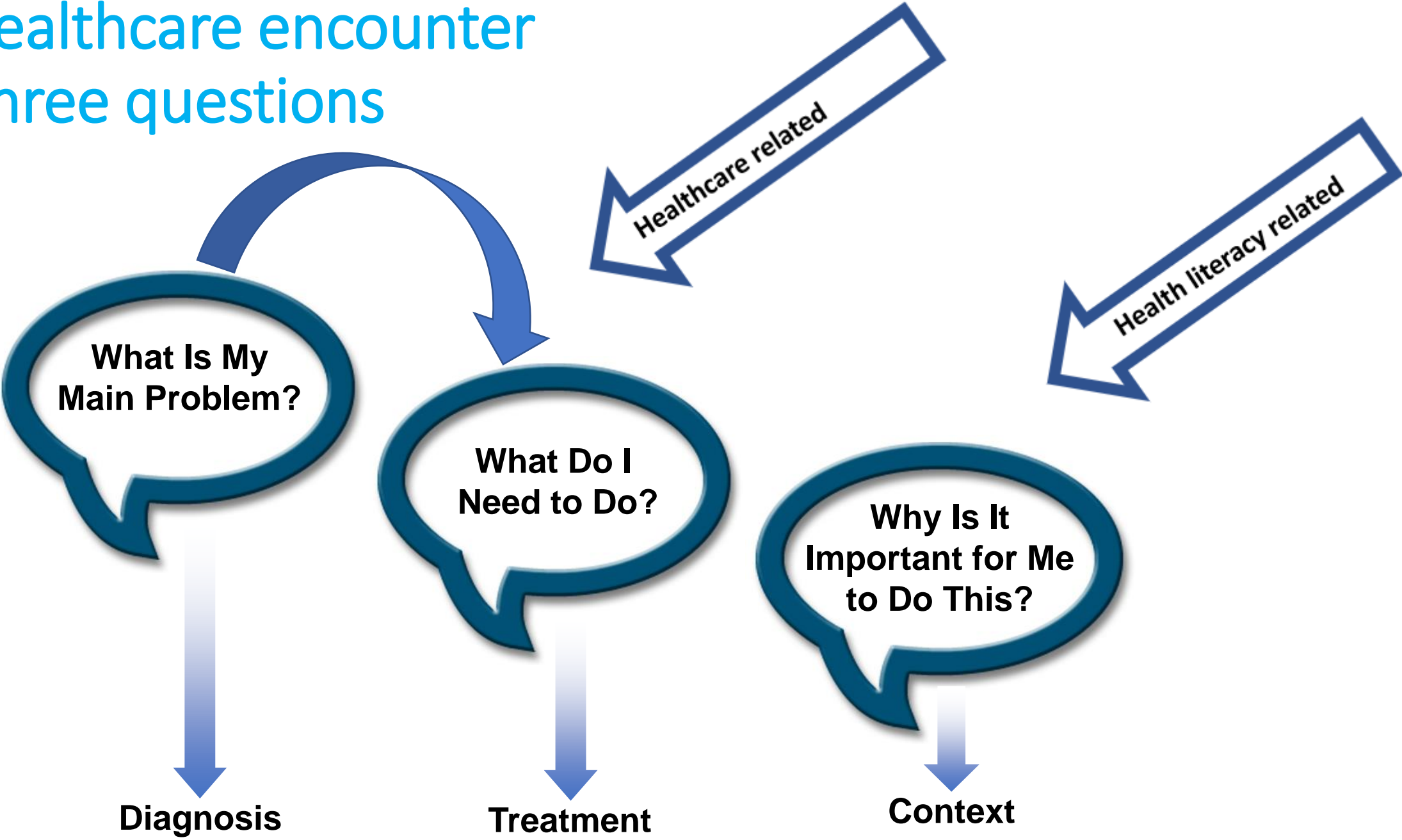
SOURCE: Schuster, 2014.

Low Health Literacy on both side Impacts patient's ability to fully engage in the Healthcare System

*We all agree about this. Challenge is to measure it
Translate into meaningful message to address it*

HUMAN COST and ECONOMICAL COST

Every healthcare encounter is just three questions



Quantification of Public Health Literacy

- An outcome of health education
(as a strategy of health promotion)
- A determinant of the quality of health care
- A determinant of health outcomes and health care costs
- A mediator of the relationship between SES / education and health outcomes

Quantification of Public Health Literacy

- **Outcomes of health care**

People with low health literacy have

- lower adherence to recommendations for treatment
- less self care
- more chronic disease
- 1,5 times higher mortality (Baker et al., Arch Int Med, 2007).

- **Outcomes of prevention**

People with low health literacy

- have less healthy lifestyles
- participate less in screening

- **Health care expenditure**

More (unnecessary) use of health care services leads to higher costs

Between 143 \$ and 7 798 \$ extra per patient/year (Eichler et al, Int J
2009)

Public Health

Why do we need to assess public health literacy?

4

IMPLICATIONS OF HEALTH LITERACY FOR PUBLIC HEALTH

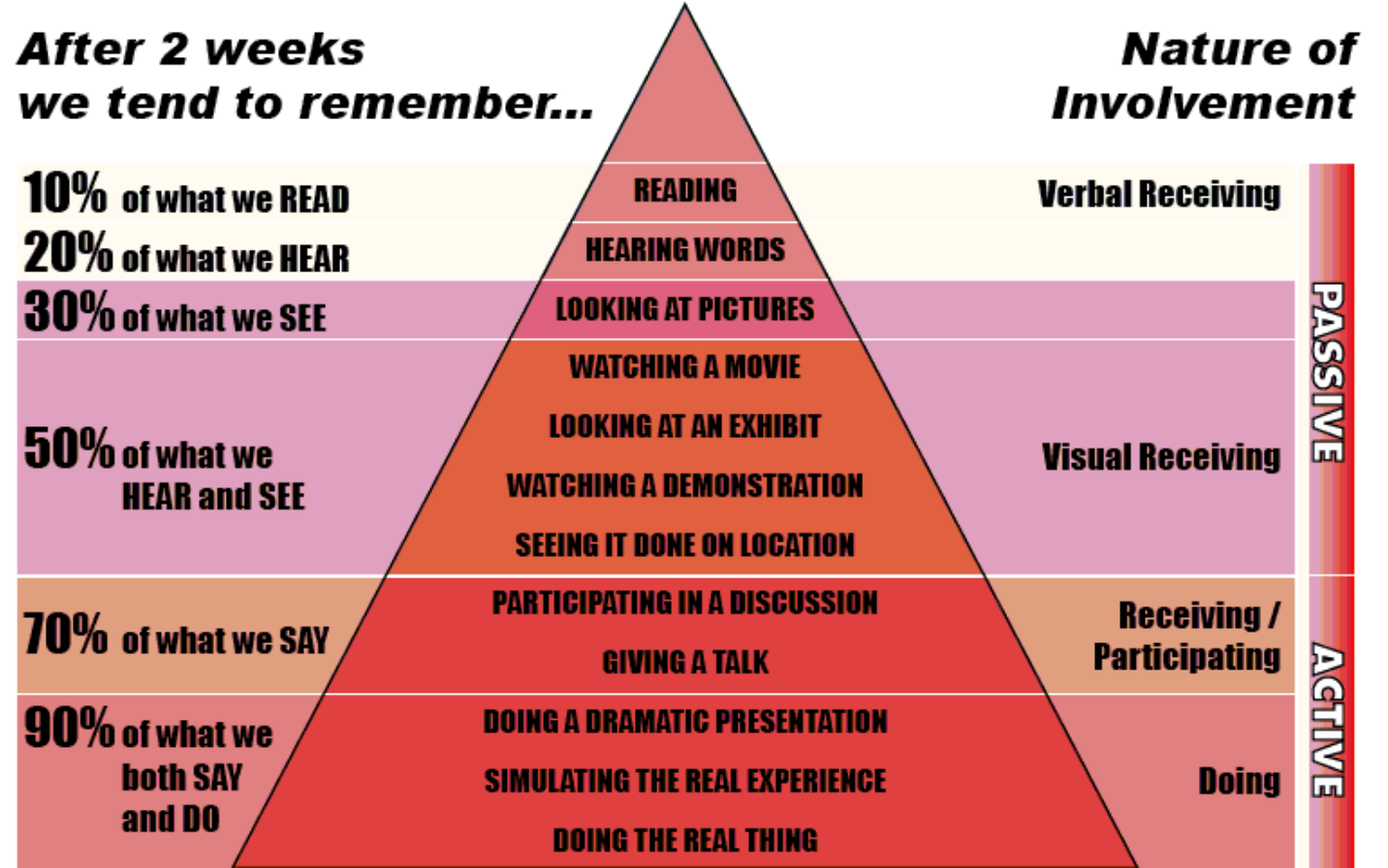
TABLE 2-1 Actions Needed in the Provision of Public Health's Essential Services

Essential Services of Public Health	Actions
1. Health promotion	Monitor
2. Health protection	Diagnose
3. Environmental health	Inform
4. Occupational health	Mobilize
5. Disease prevention and screening	Develop
6. Disaster preparedness	Enforce
7. Mobilization	Link
8. Health policy	Assure
9. Data collection and dissemination	Evaluate
10. Workforce training and development	Research

SOURCE: Rudd, 2013.

Public Health literacy is multidimensional

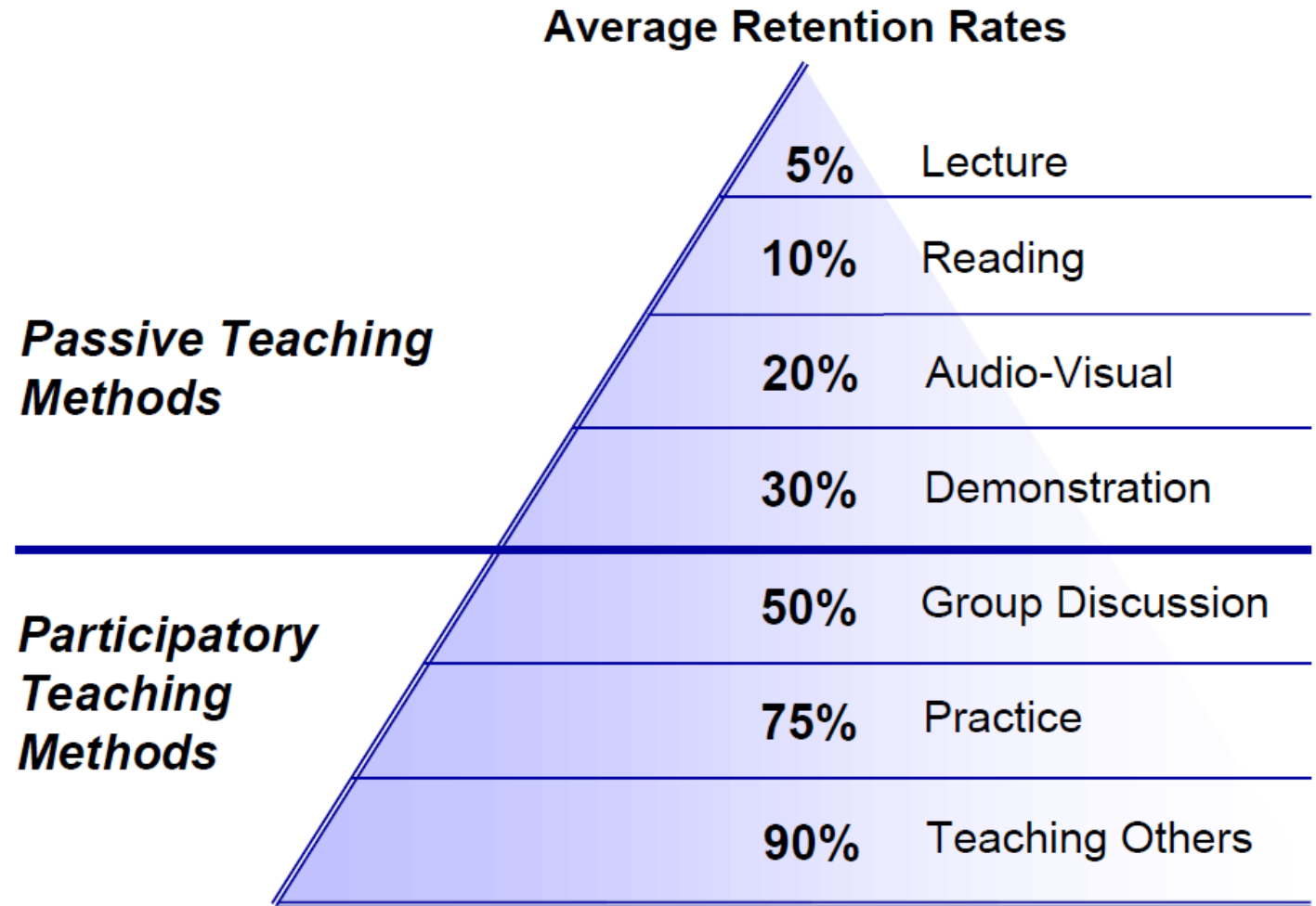
Cone of Learning (Edgar Dale)



Edgar Dale, *Audio-Visual Methods in Technology*, Holt, Rinehart and Winston.

Effective way to learn is to teach

The Learning Pyramid*



*Adapted from National Training Laboratories. Bethel, Maine

How to Bridge the Health Literacy Gap

 PDF  PRINT  COMMENTS

SHARE   

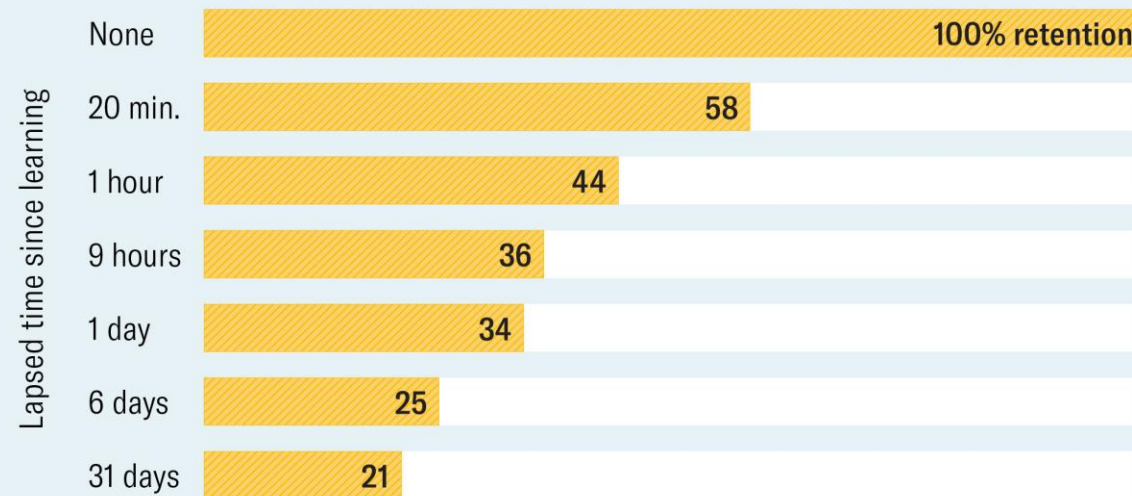
Communicating with patients in a way they understand will lead to better outcomes and avoid mistakes and uncertainty.

Barry D. Weiss, MD

Fam Pract Manag. 2014 Jan-Feb;21(1):14-18.

The Forgetting Curve

If new information isn't applied, we'll forget about 75% of it after just six days.



Source: Hermann Ebbinghaus
From: "Where Companies Go Wrong with Learning and Development," by Steve Glaveski, 2019

The biggest problem with communication is the illusion that it has occurred.

-George Bernard Shaw

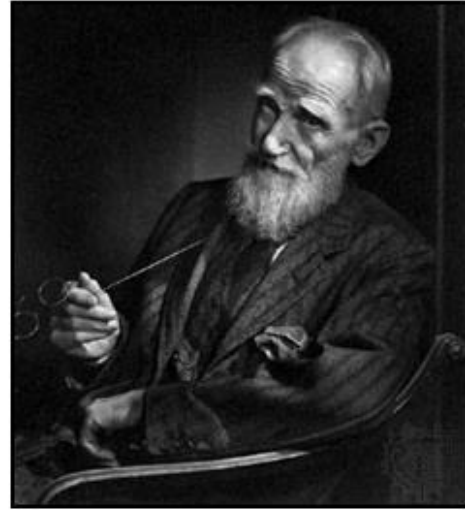


Figure 4. Adults' Health Literacy, By Highest Level of Educational Attainment: 2003

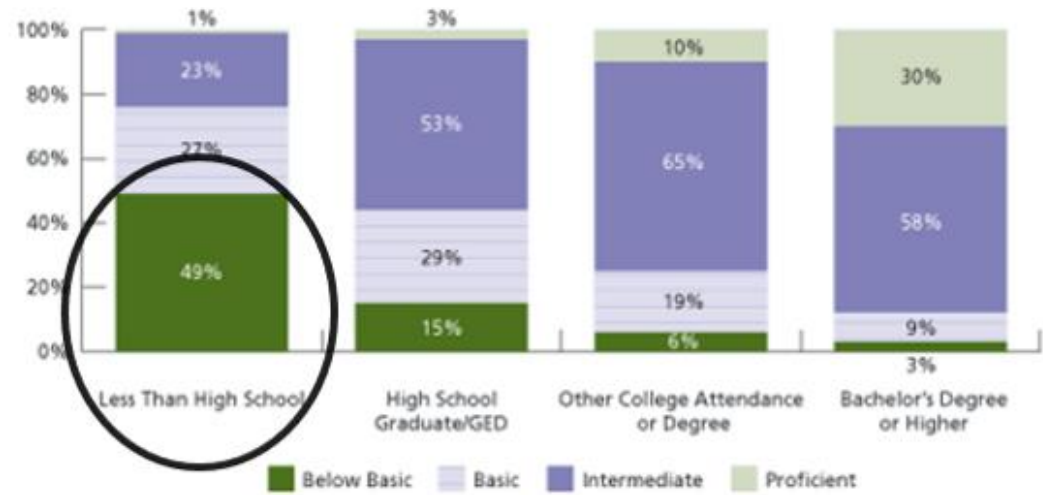
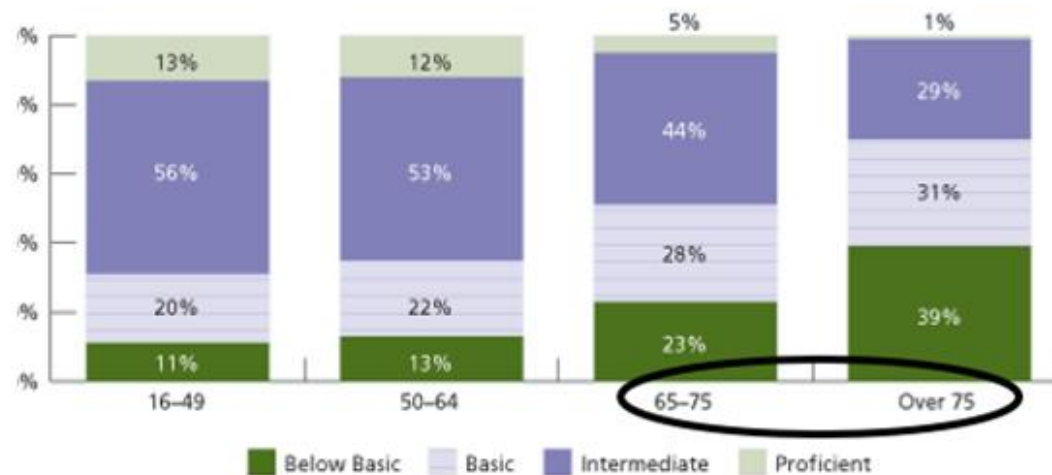


Figure 5. Health Literacy of Adults, By Age: 2003



Physicians routinely overestimate the health literacy skills of their patients and assume that patients understand more than they actually do. *Am Pract Manag.* 2014 Jan-Feb;21(1):14-8.

Source: U.S. Department of Education, Institute of Education Sciences, 2003 National Assessment of Adult Literacy.

Literacy challenge India

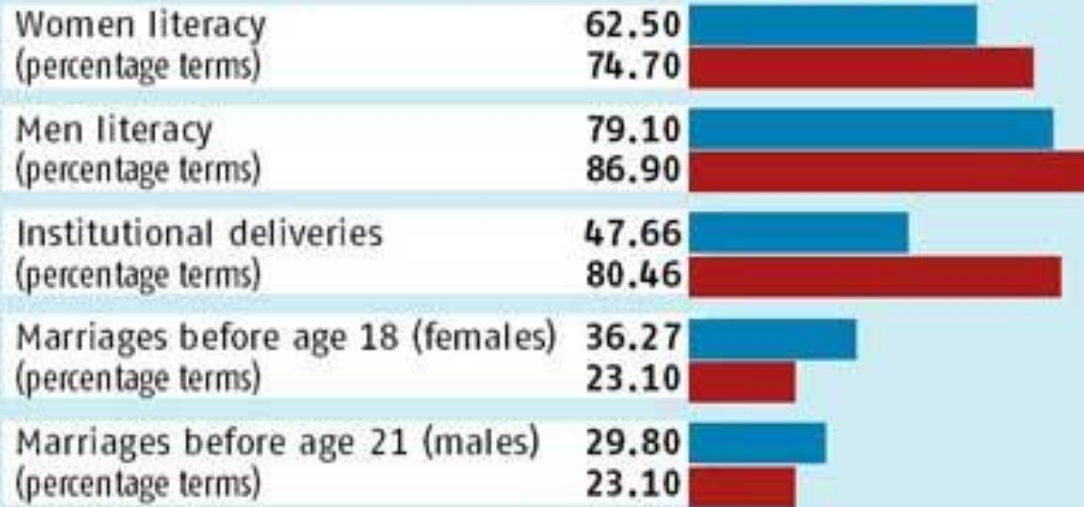
SOME GOOD AND SOME BAD NEWS

Sex ratio
(Females per thousand males)

1,000

985

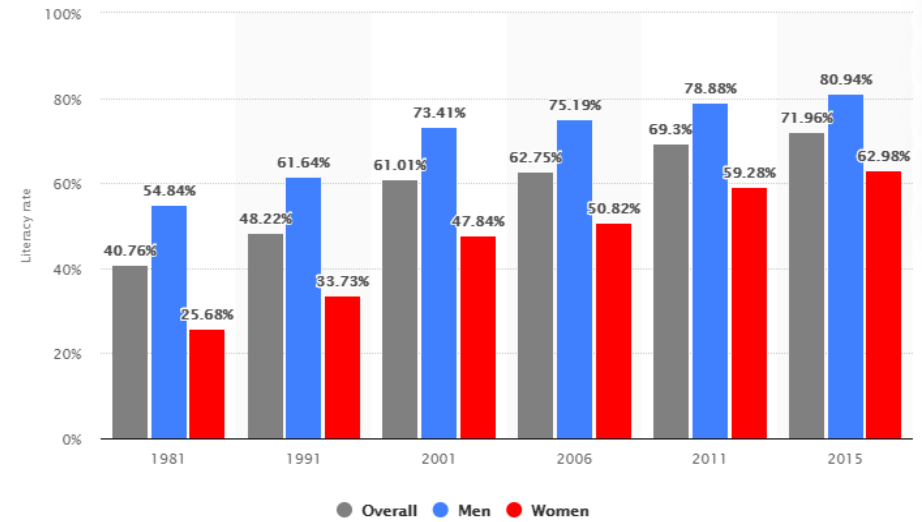
■ (NFHS-3) 2005-06 ■ (NFHS-4) 2015-16



The data are for 11 states:

Source: National Family Health Survey-4

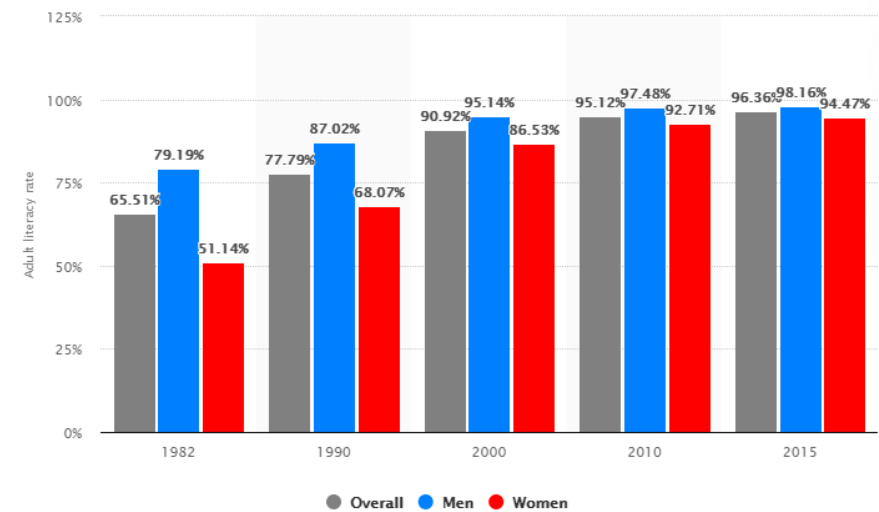
India: Literacy rate from 1981 to 2015



Additional Information

© Statista 2019

Adult literacy rate in China from 1982 to 2015*



Additional Information

© Statista 2019

Patients: Demand side

- Up to 80% of Patients Forget What Their Doctor Tells Them As Soon As They Leave the Doctor's Office
- Nearly 50% of What They Do Remember is Recalled Incorrectly

Clinicians: Supply side

- Some are not aware of the problem
- Not sure how to ask
- Not sure how to respond
- Do not want to open the can of worms

Verbal Communication Problem on both side

Patients experience shame around the issue

- 14% of patients say they feel awkward admitting they don't understand;
- 79% feel others don't understand

Providers experience time challenges

- Providers interrupt patients **30 seconds** after they start speaking;
- If not interrupted, patients will speak less than **two minutes**






Dr. Lester Breslow UCLA Fielding School of Public Health

Tribute

- Notable work on measurement of health
- Personal responsibility vs social responsibility
- Risk reduction models

Three dimensions of public health – Two accomplished and one pending

- Prevention of Communicable diseases 
- Treatment of chronic diseases 
- Health equity related to social determinants. 

Lester Breslow, Who Linked Healthy Habits and Long Life, Dies at 97

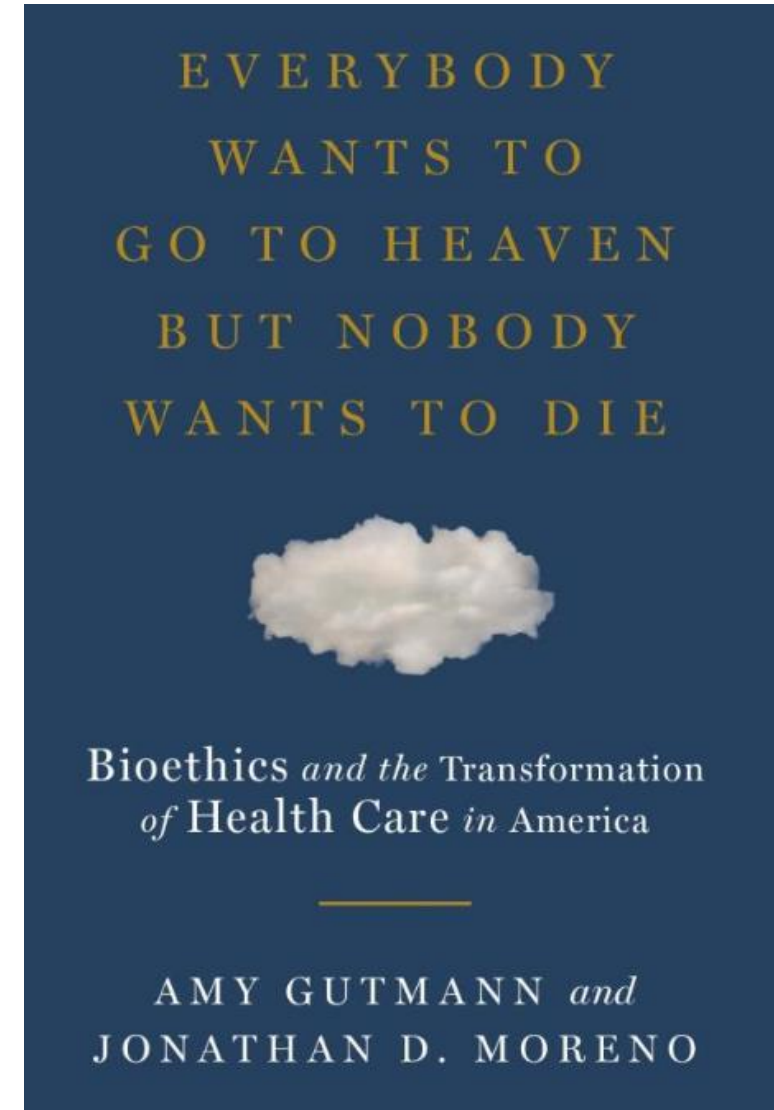
By Douglas Martin

April 14, 2012



Grandfathering the tradition of medical Profession

- Doctor knows best
- Paternalistic approach
- Prescription is a quintessential symbol of a doctor that heals everything and everyone

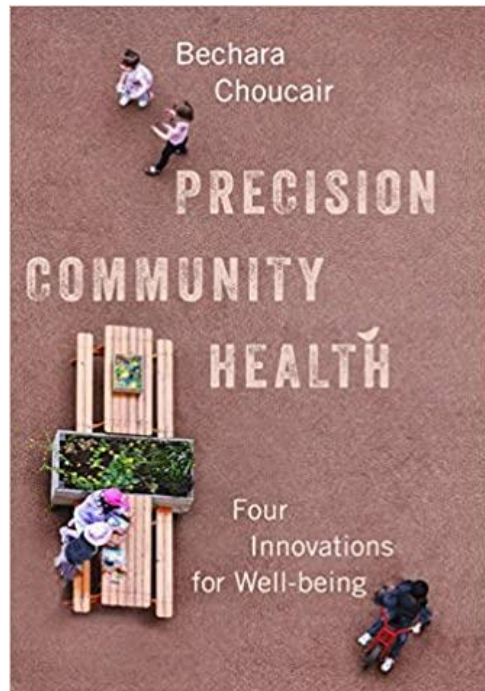


Medical Education: The Backbone of the Healthcare System

- Is medical education still on 19th Century mindset?
- Medical student selection process – Painful and nerve-racking:
 - Emphasis on memorization
 - Professors in Medical school are always right
 - Hierarchy
 - Disease and treatment responsibility of a physicians
- Are doctors disease management experts rather than health experts?

Public health literacy as a solution: Bold disruptive idea

- Applying medical model to public health have indeed led to improvements.
- At the same time, it has missed key insights and roles of community involvement.



The Rockefeller Foundation's Precision Public Health Initiative

The Rockefeller Foundation has been working to improve health for more than a century. Now, we are building on our legacy by launching a major initiative to harness the power of data and data science to reduce inequities in global health.

The Precision Public Health Initiative aims to leverage data and analytic tools to accelerate progress on the world's greatest public health challenges, starting with reducing maternal and child deaths in low- and middle-income countries. We are pleased to be partnering with UNICEF, the World Health Organization, global health funding agencies, ministries of health, and technology companies, among others.

Together we can create and share knowledge and tools that will usher in a new era of data-driven decision making for public health.

– Naveen A. Rao, MD, Senior Vice President, Health,
The Rockefeller Foundation

A photograph of a woman wearing a purple sari and a bindi, looking at a smartphone. She is in a crowd, and another person's hand holding a colorful balloon is visible in the background.

Is it risky to confront the tradition and reverse the knowledge dissemination

For the exclusive use of N. Prasad, 2019.

Harvard Business Review 
www.hbr.org

Every company faces a learning dilemma: the smartest people find it the hardest to learn.

Teaching Smart People How to Learn

by Chris Argyris

Sheena Iyengar: World expert in Choices, Professor of Business in Columbia Business School, graduate for Stanford University and U Penn USA



I believe our ability to create meaningful choices remains our greatest tool for innovation.



In today's world, the smartest person in the room is no longer the person who has the answers, but the one who asks the right questions to get the desired outcomes.

Truth hurts: Lens of communities

- Zip code of your address and the side of street you live are stronger predictors of health than your genetic code
- Social policy, health literacy, fiscal policy, and built environment issues in disease management
- Just raising taxes on cigarettes and alcohol will not fix the problem, what about banning the stores/sales within 2 kms of schools and family neighborhood.

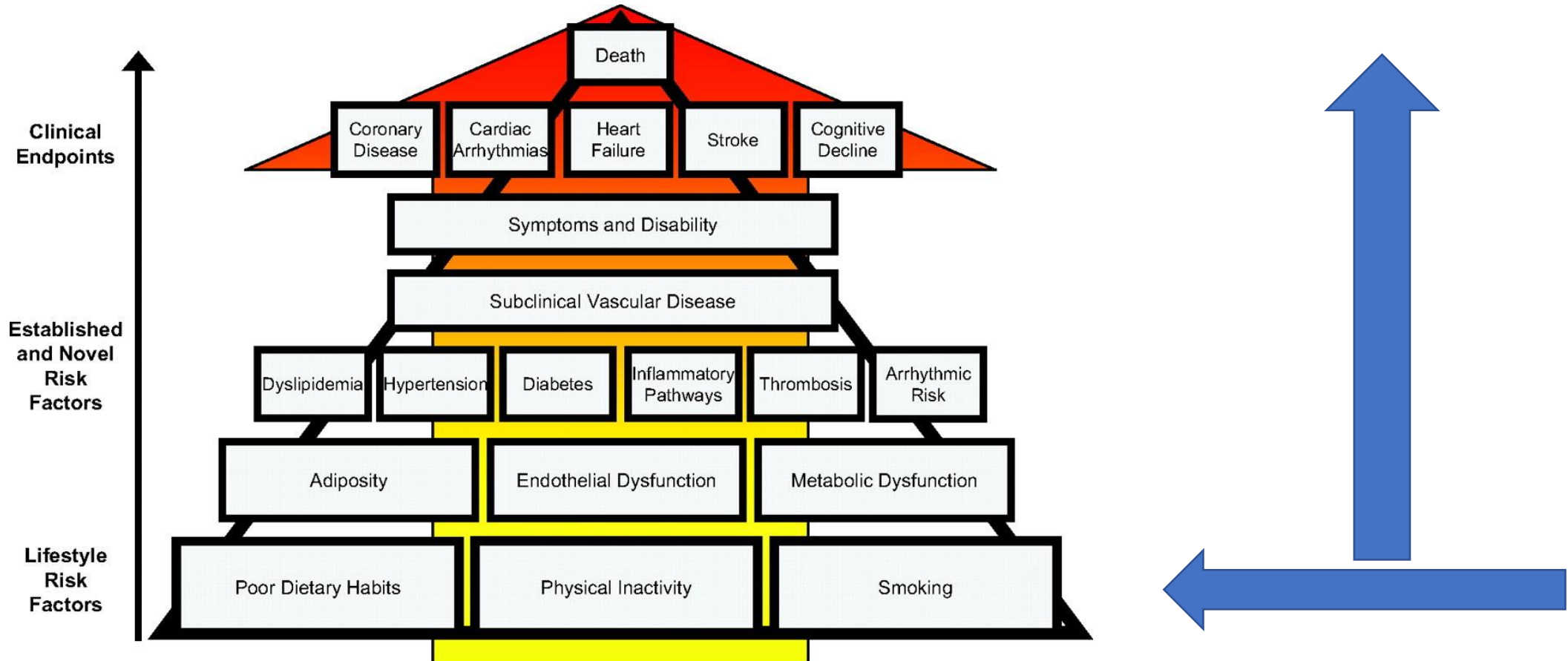


Traditional risk factors

Beyond Established and Novel Risk Factors

Lifestyle Risk Factors for Cardiovascular Disease

Dariusz Mozaffarian, MD, DrPH, Peter W.F. Wilson, MD, and William B. Kannel, MD, MPH



Beyond individual behaviors

- Columbia University, New York
- Johns Hopkins University, Baltimore
- Northwestern University, Chicago
- UCLA, Los Angeles
- University of Minnesota, Twin Cities
- Wake Forest University, Winston Salem

Reading: The Impact of Neighborhoods on CV Risk

Share: f t g+ in

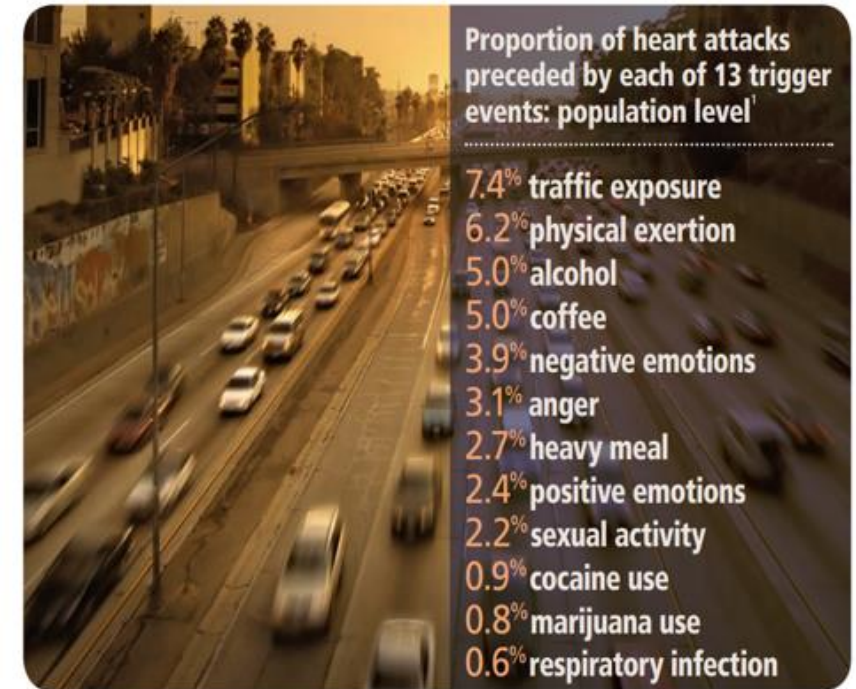
Review

The Impact of Neighborhoods on CV Risk

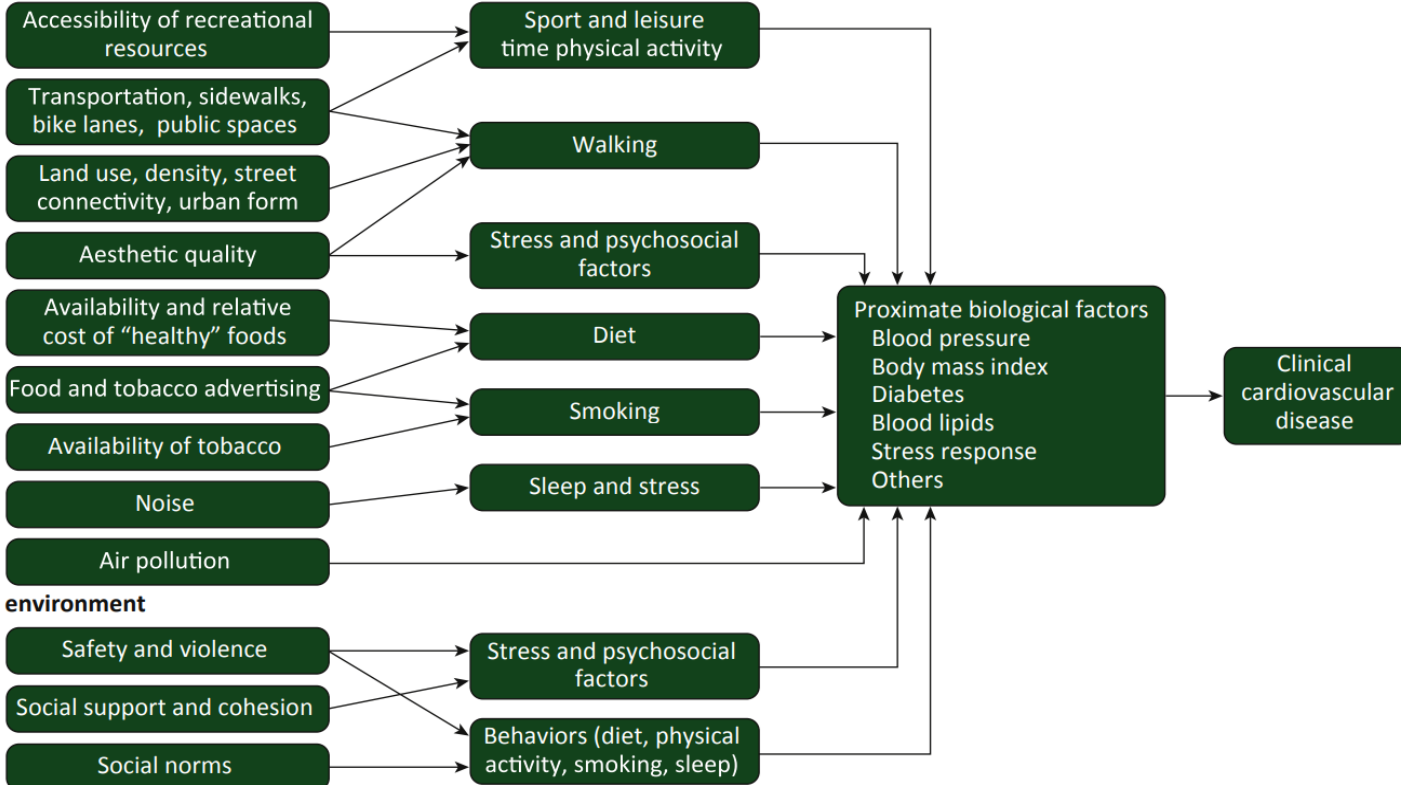
Authors: Ana V. Diez Roux, Mahasin S. Mujahid, Jana A. Hirsch, Kari Moore, Latetia V. Moore

THE LANCET

Tim S Nawrot Dr, Laura Perez PhD, Nino Künzli Prof, Elke Munters MD and Benoit Nemery Prof
Lancet, The, 2011-02-26, Volume 377, Issue 9767, Pages 732-740, Copyright © 2011 Elsevier Ltd



Physical environment

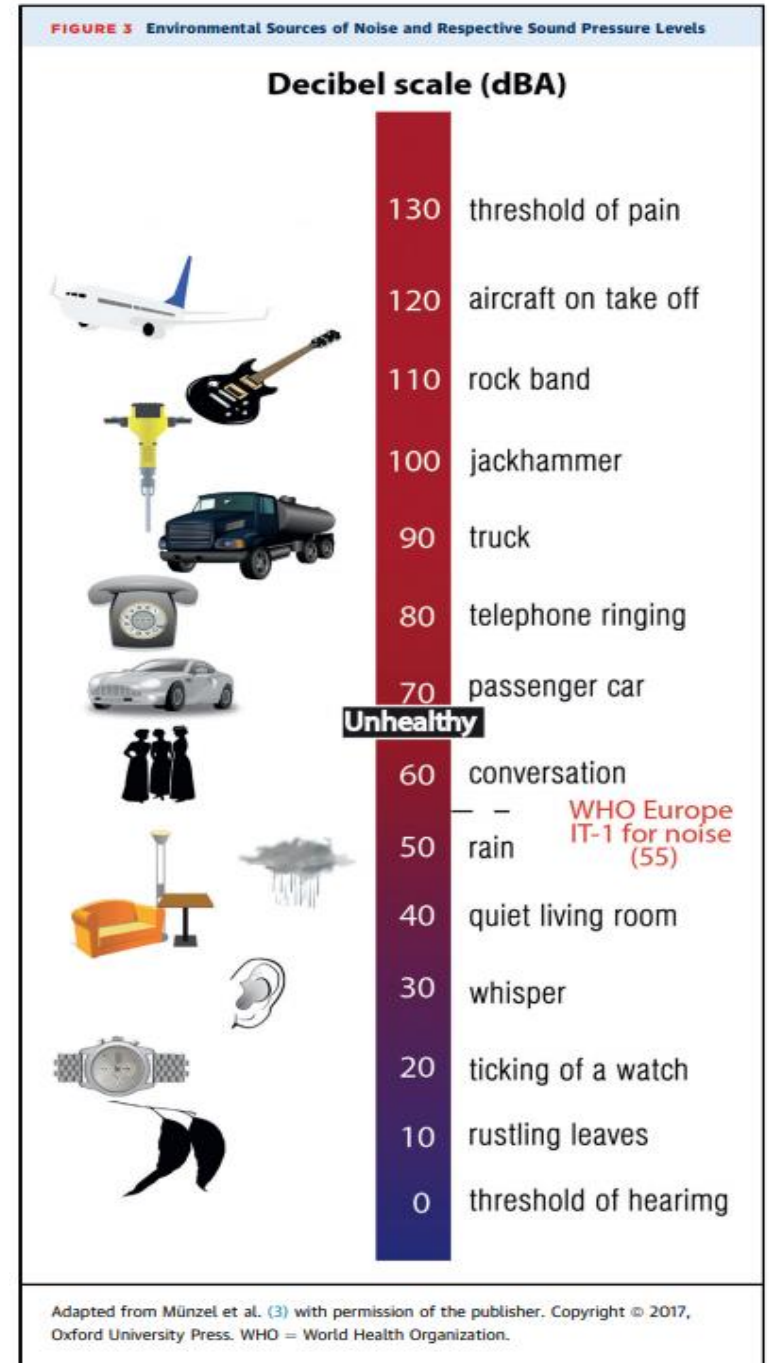


Noise as a risk factor for CVDs

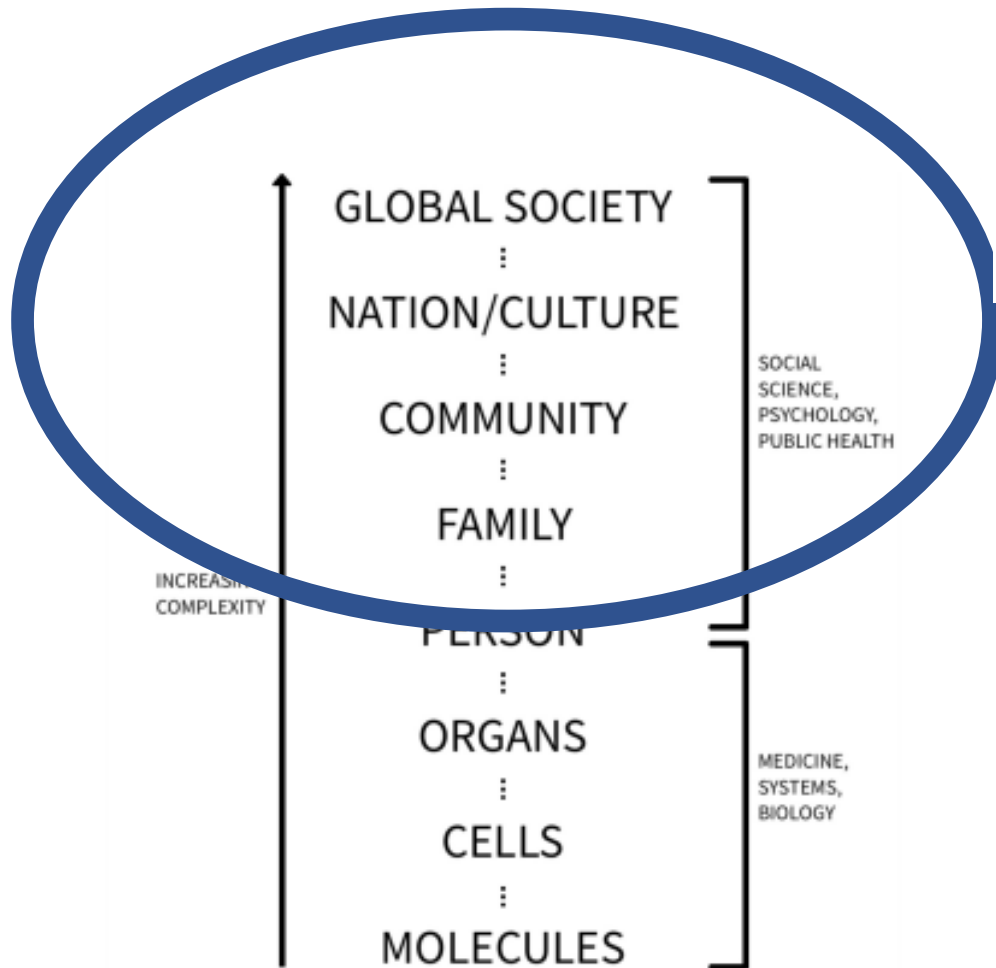
TABLE 1 Noise-Abatement Approaches

Abatement Procedures	Reduction in Noise, dB	Cost-Effectiveness Score (1-5)*
Noise barriers	3-20	2
Brake blocks for trains	8-10	4
Building insulation	5-10	1
Building design	2-15	3
Changing driving styles	5-7	3
Quiet road surfaces	3-7	5
Low-noise tires	3-4	3
Land-use planning and design	Unknown	4
Electric cars	1	1
Traffic management	3	3

*Evaluated by the European Commission in "10 ways to combat noise pollution" (70). Lowest score = 1; highest score = 5.
dB = decibel.



Social determinants are upstream issues



Circulation

Volume 132, Issue 9, 1 September 2015, Pages 873-898
<https://doi.org/10.1161/CIR.0000000000000228>



AHA SCIENTIFIC STATEMENT

Social Determinants of Risk and Outcomes for Cardiovascular Disease

A Scientific Statement From the American Heart Association

> [Lancet](#). 2008 Nov 8;372(9650):1661-9. doi: 10.1016/S0140-6736(08)61690-6.

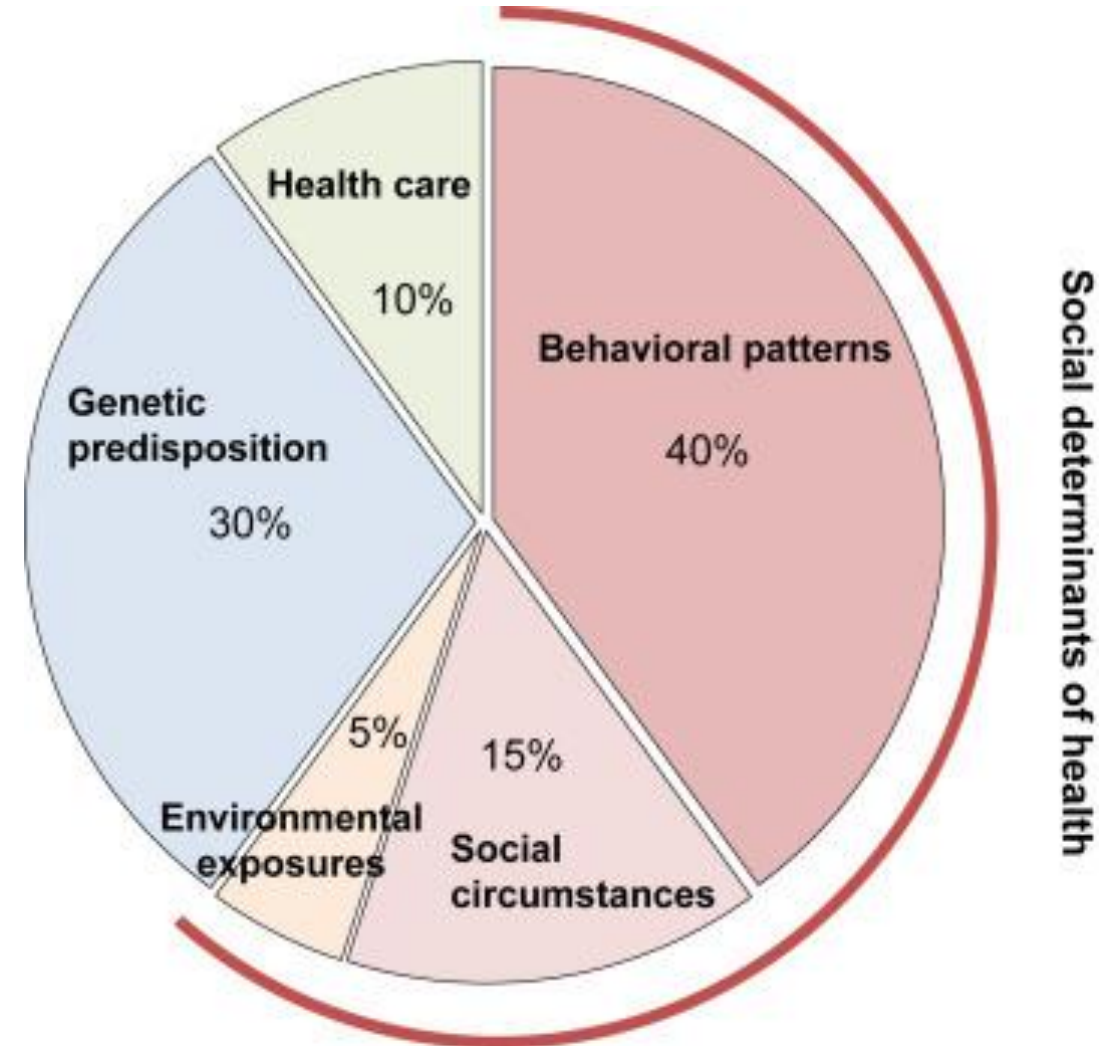
Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health

Michael Marmot¹, Sharon Friel, Ruth Bell, Tanja A J Houweling, Sebastian Taylor, Commission on Social Determinants of Health

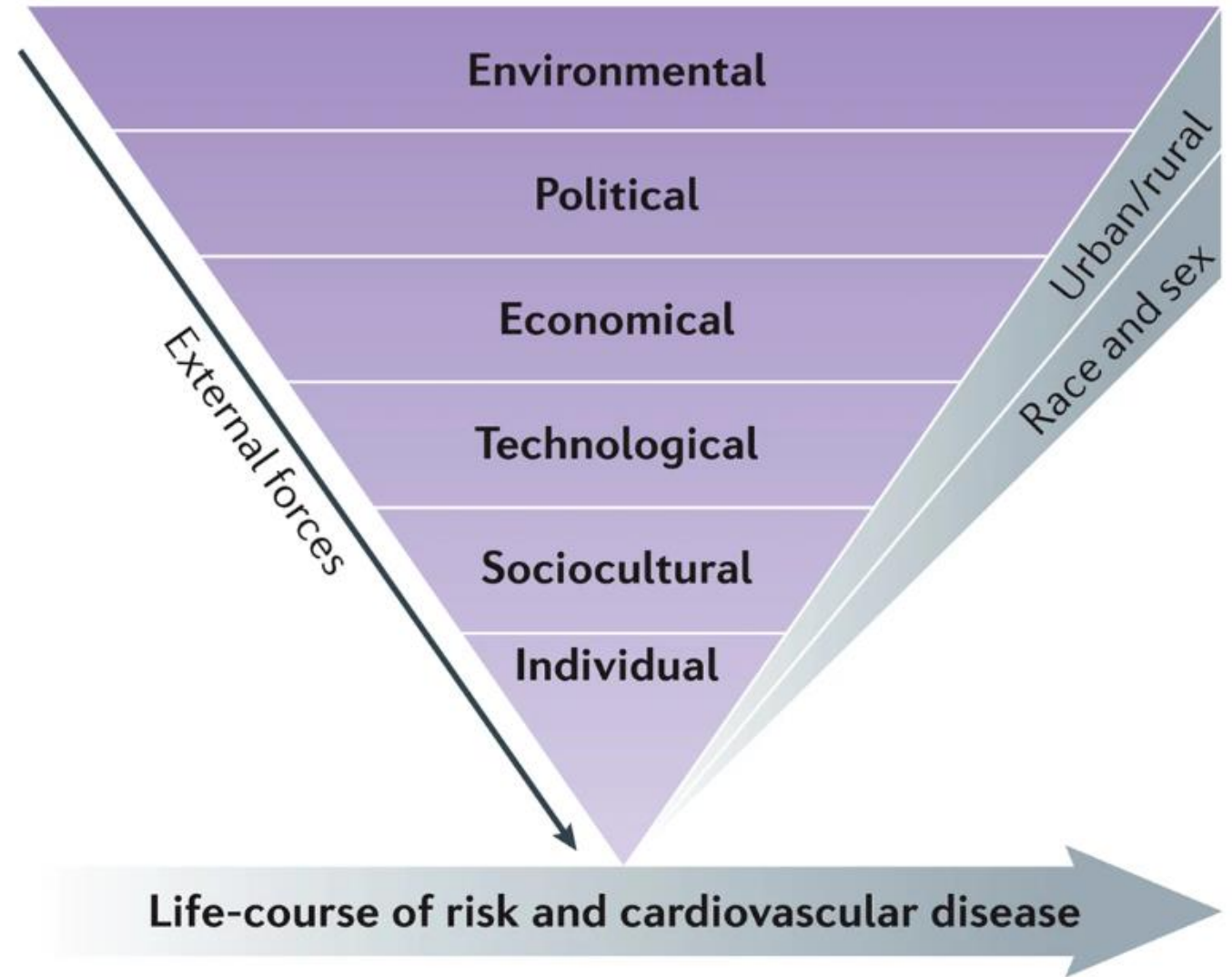
Figure 1 Hierarchically organised system of human health, adapted from Engel.²⁸

Social and behavioral issues together decide 70% of health

- Social circumstances and environmental causes determinants account for about 30 percent of the health problems.
- Health behaviors accounting for another 40 percent



Life course risk



Nature Reviews | Cardiology

Adapted from Etches, V. *et al.* Measuring population health: a review of indicators. *Annu. Rev. Public Health* 27, 29–55 (2006), with permission from Annual Reviews.

Larger challenges



- Readiness for natural disasters during CoVID: As the nation moves into hurricane season, communities already experiencing heightened socioeconomic vulnerabilities
- Voting during Pandemic: Threat to democracy. Remote voting ????
- Suicides and domestic violence, mental illness, Economic stress, social isolation
- Deterioration of community resilience: Decreased access to community/religious support/temples/Mosques

Disease burden varies by ethnicity and caste

Ethnic minority group (Hui) and the majority group (Han) in the city. Socio-spatial segregation in terms of the locations where individuals conduct their everyday activities. these studies underpinned the necessity to accurately delineate contextual areas that also include the locations of people’s daily activities beyond residence-based neighborhoods, rather than relying solely on residence-based neighborhoods

Article

Examining Ethnic Exposure through the Perspective of the Neighborhood Effect Averaging Problem: A Case Study of Xining, China

Yiming Tan ¹, Mei-Po Kwan ^{2,3} and Zifeng Chen ^{4,*}

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² Department of Geography and Resource Management, and Institute of Space and Earth Information Science, Chinese University of Hong Kong, Shatin, Hong Kong, China; mpk654@gmail.com

³ Department of Human Geography and Spatial Planning, Utrecht University, 3584 CB Utrecht, The Netherlands

⁴ Department of Urban Planning and Design, The University of Hong Kong, Pokfulam, Hong Kong, China

* Correspondence: czfurban@gmail.com

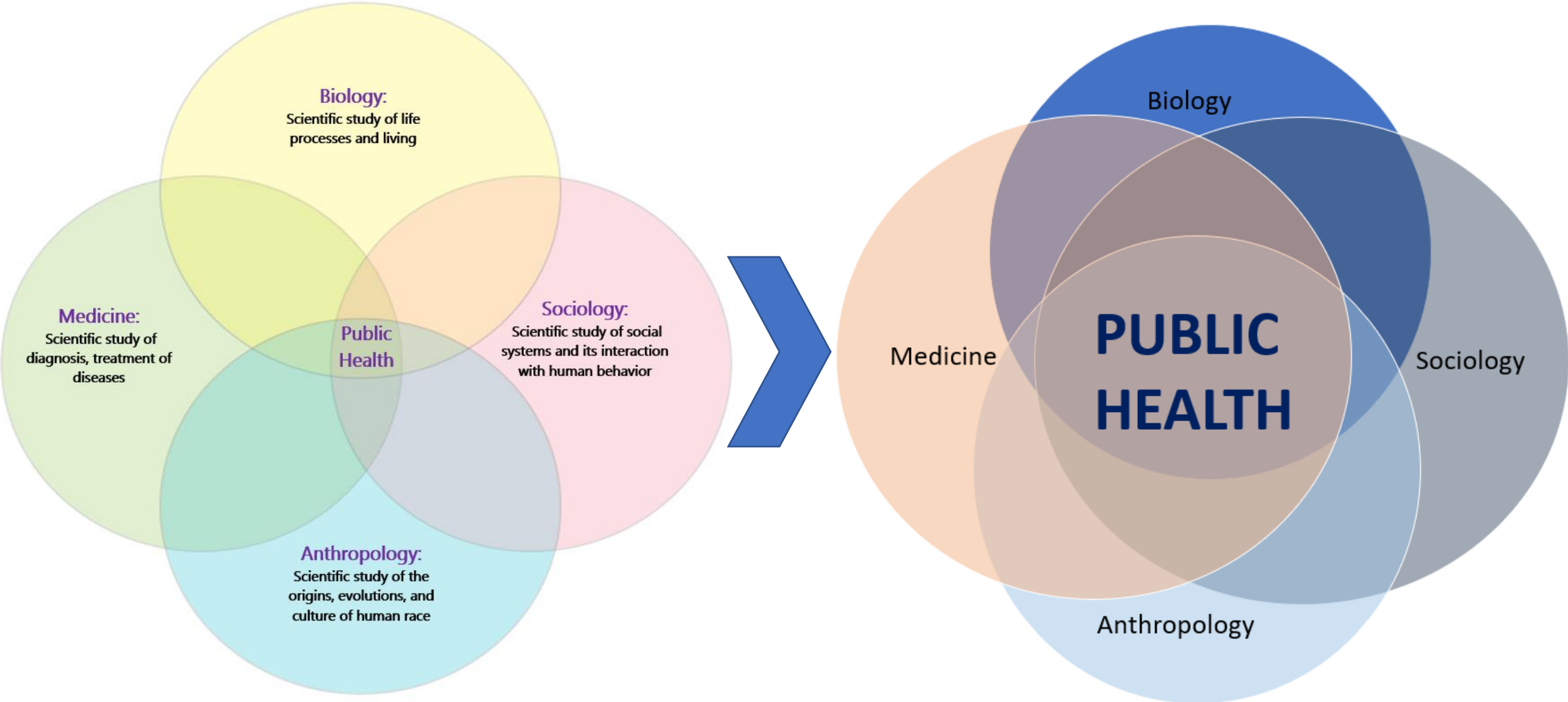
Received: 7 March 2020; Accepted: 17 April 2020; Published: 21 April 2020



Table 5. Average activity duration in each type of activity place and percentage of participants that have at least once visited this type of activity place.

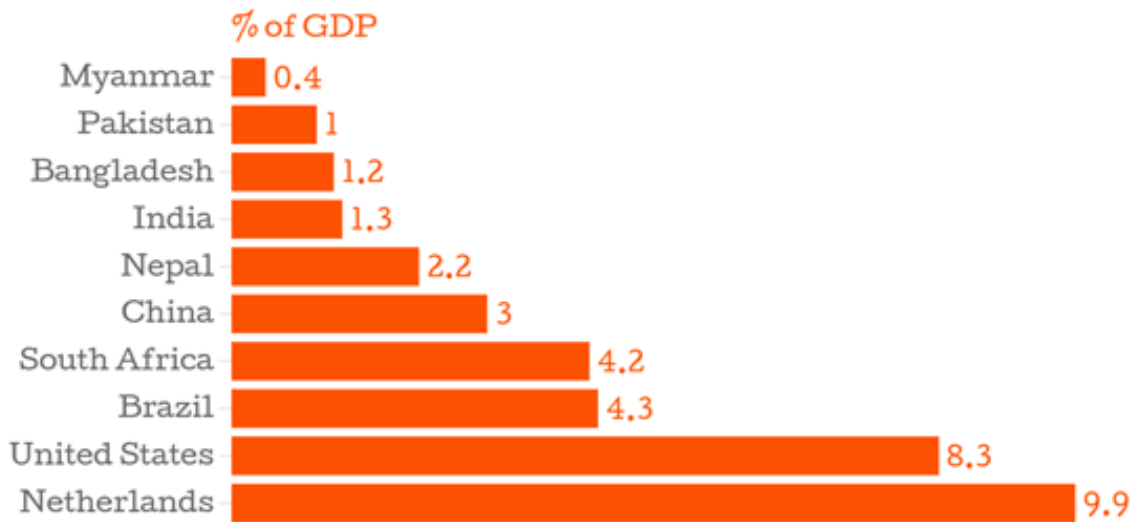
Activity Places	Average Activity Duration		Percentage of Participants	
	Hui Residents	Han Residents	Hui Residents	Han Residents
	min	min	%	%
Workplaces	471	423	53.5	63.6
Relatives' home	62	46	16.7	16.2
Shops	62	46	23.7	39.4
Restaurants	12	36	7.9	21.5
Parks and green spaces	26	50	11.2	26.4
Hospitals	18	16	13.7	5.2
Religious sites	52	1	16.7	1.3

Transforming people habits and experiences



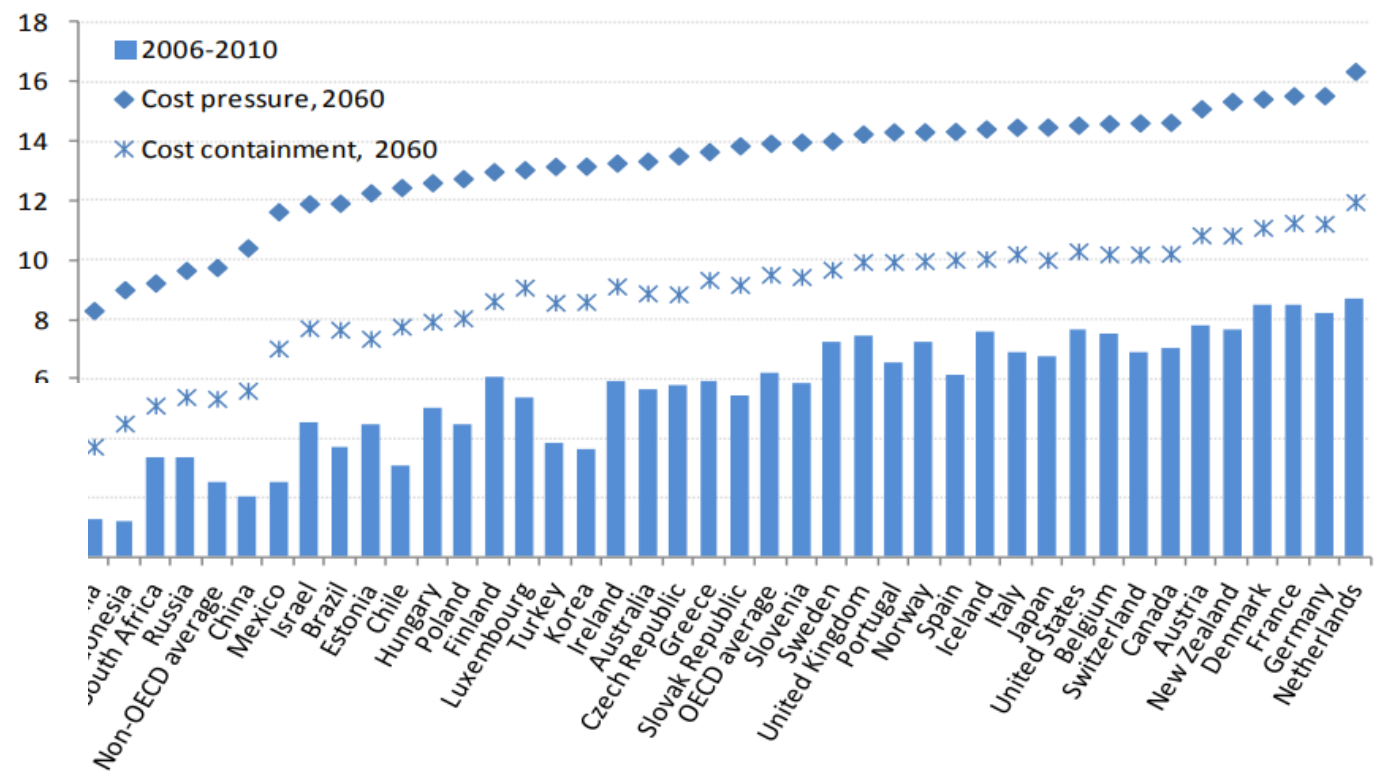
Current status of public health: India

Snapshot of public health expenditure around the world



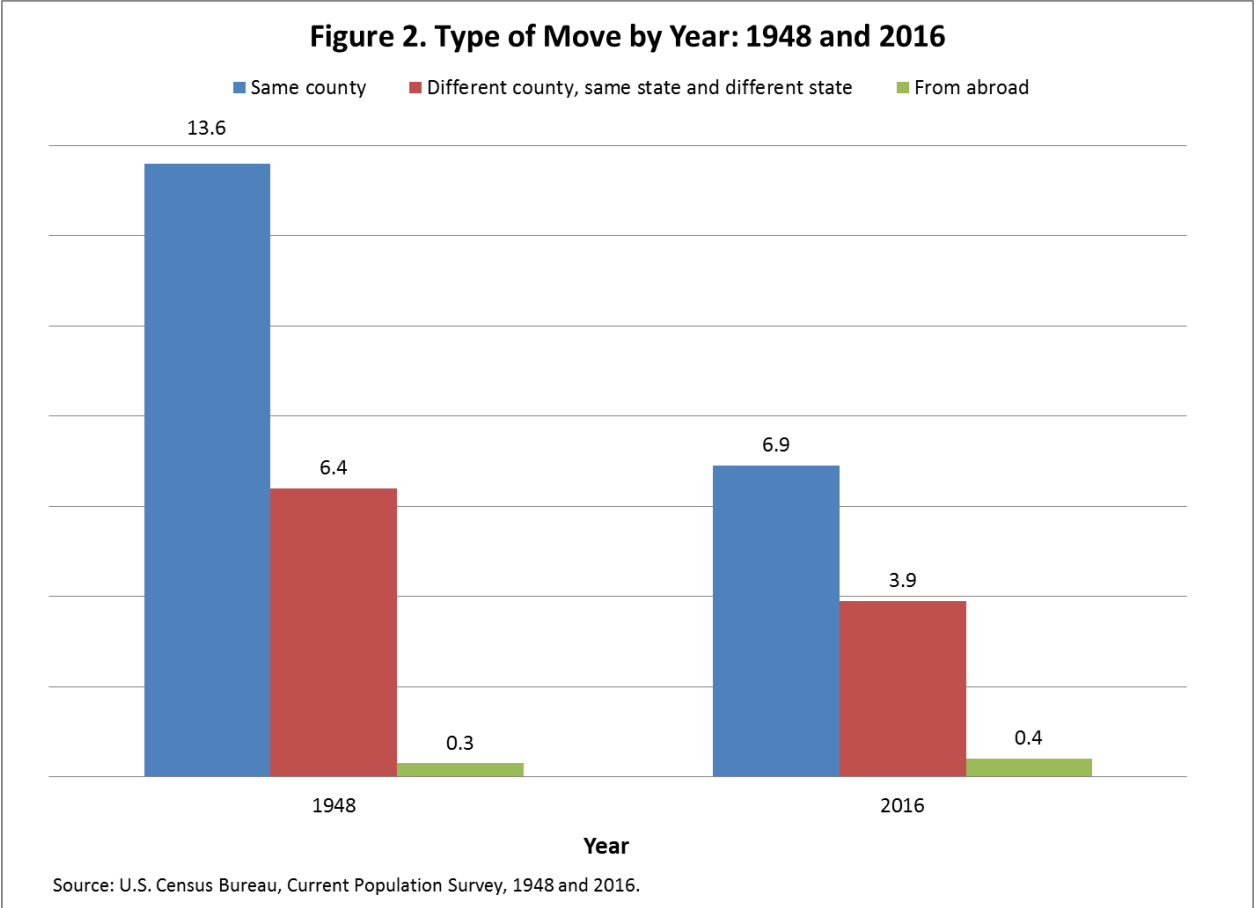
Future Health expenditure pressures are sizeable (much larger than pension systems)

Projections by country of Public Health + Long-term care expenditures (in % of GDP)



Source: de la Maisonneuve and Oliveira Martins (2013)

Most health issues that matter to the consumers are regional and different from our policy makers perception (Most people do not move from their regions)

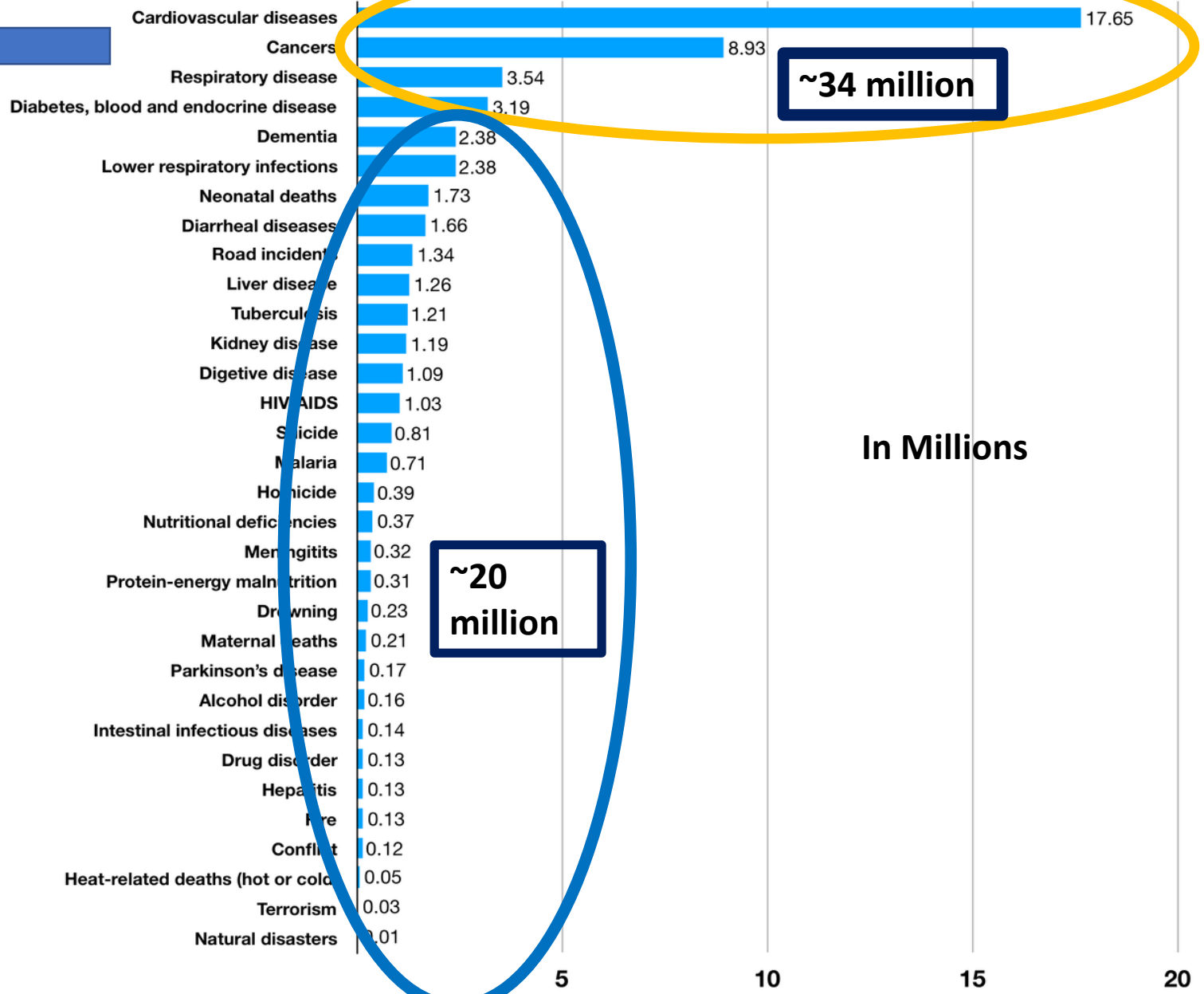


Up to 50% of all annual leading causes are preventable and related to built environment.



Annual Number of Deaths by Cause

(World) (2016)



~34 million

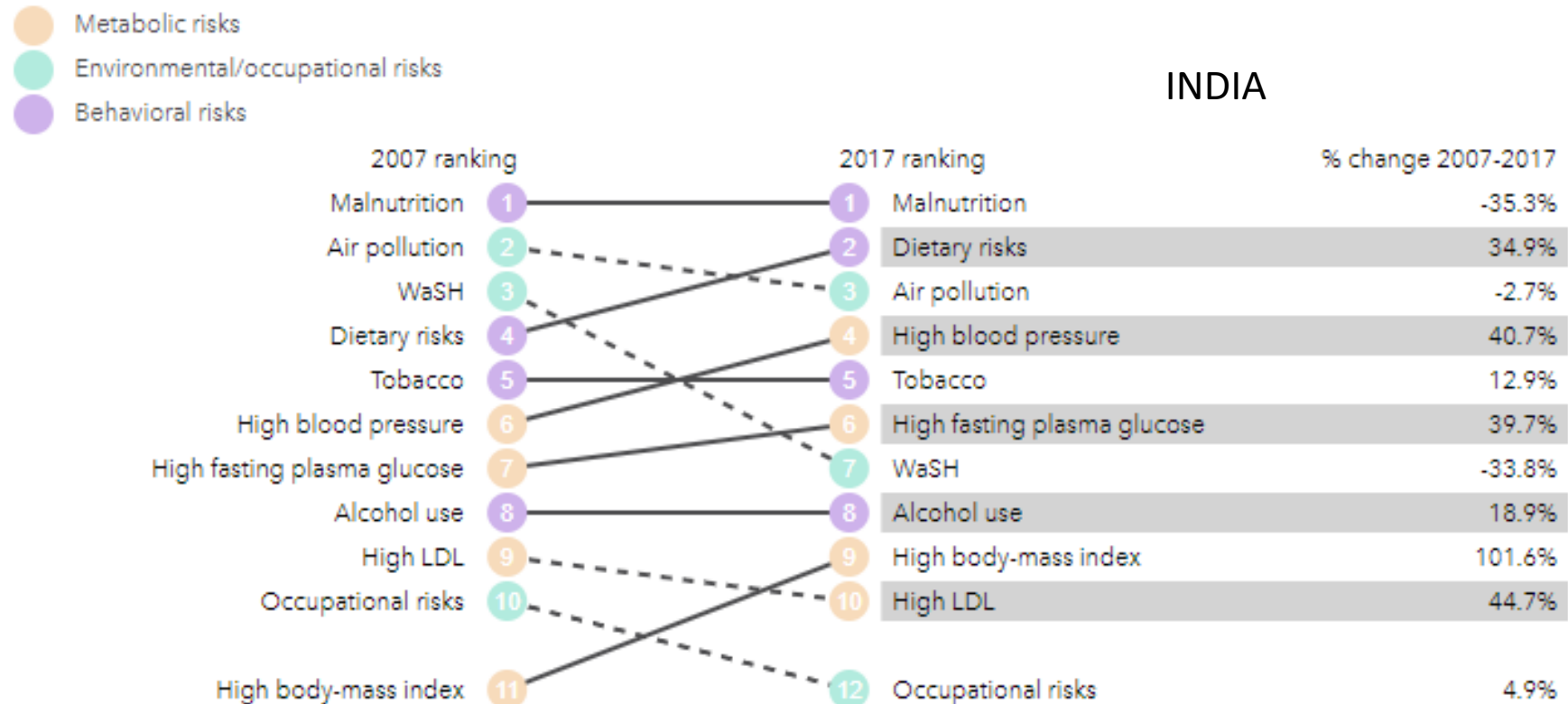
~20 million

In Millions

Millions

Who is more evil? Malnutrition or Obesity?

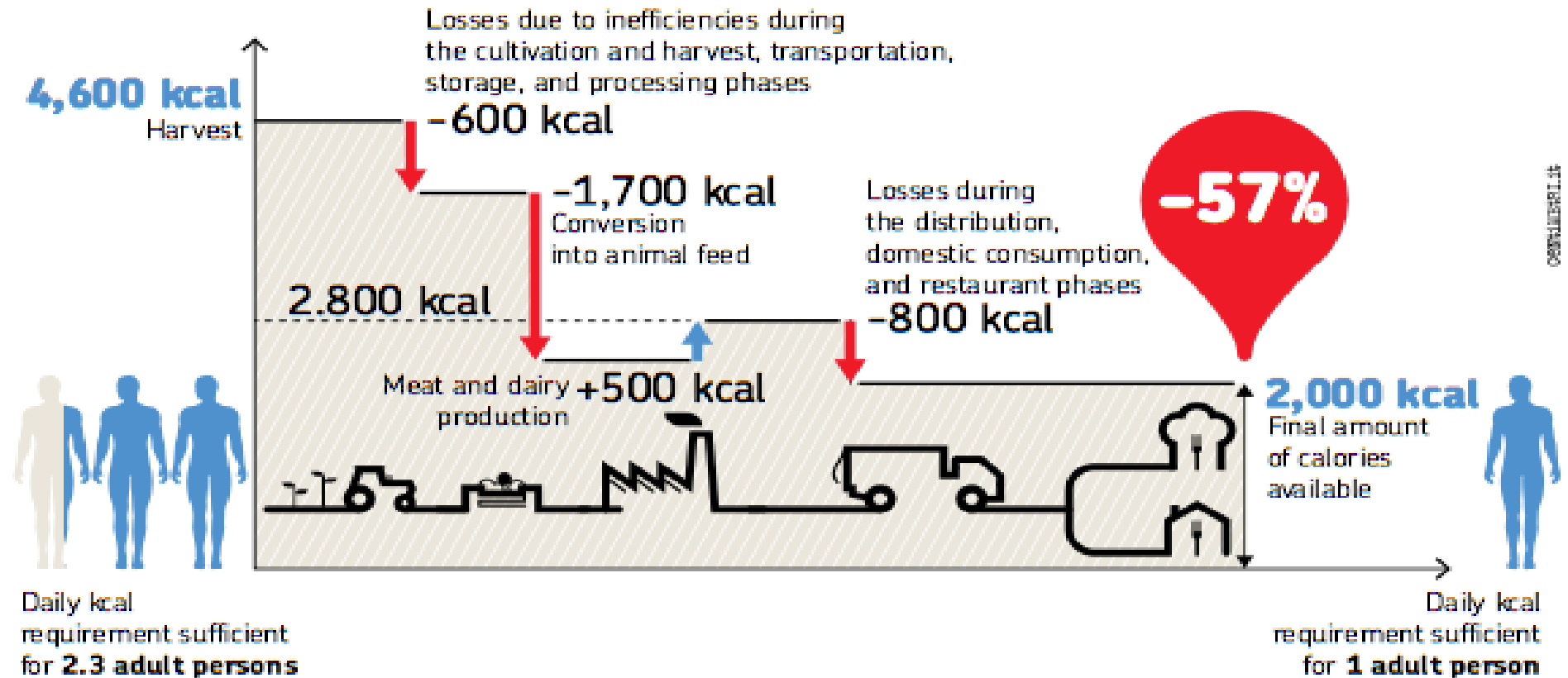
What risk factors drive the most death and disability combined?



DISPERSION OF AVAILABLE CALORIES FROM THE FIELD TO THE TABLE

BCFN interpretation of the *SMIL diagram*

Estimate of food losses along the entire chain (daily Kcal per capita)



Information asymmetry

- Indians are advised to have BMI not more than 22.9.
- John Yudkin, 60 yr (U College of London) and Chittaranjan Yajnik 52 ys KEM Hospital Pune India

The Y-Y paradox

Chittaranjan S Yajnik, John S Yudkin

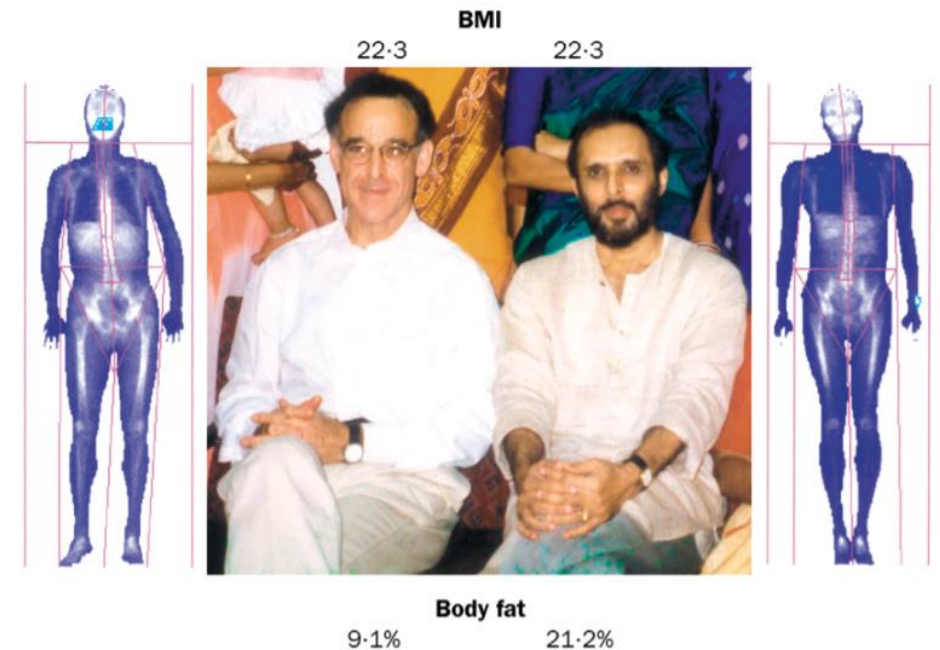
At any body mass index (BMI) and age, Asian Indians have

higher body fat, visceral fat and waist circumference (WC)

lower skeletal muscle mass

thinner hips; short legs

profoundly higher rates of insulin resistance

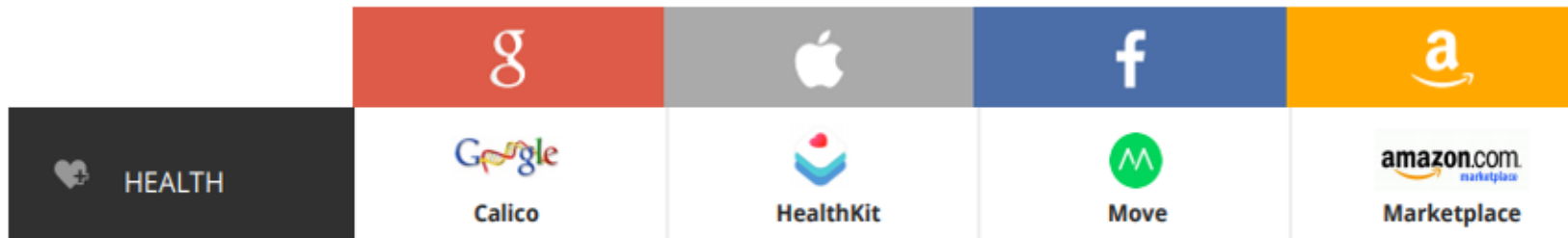


https://www.who.int/nutrition/publications/bmi_asia_strategies.pdf

Disrupting the way we are learning



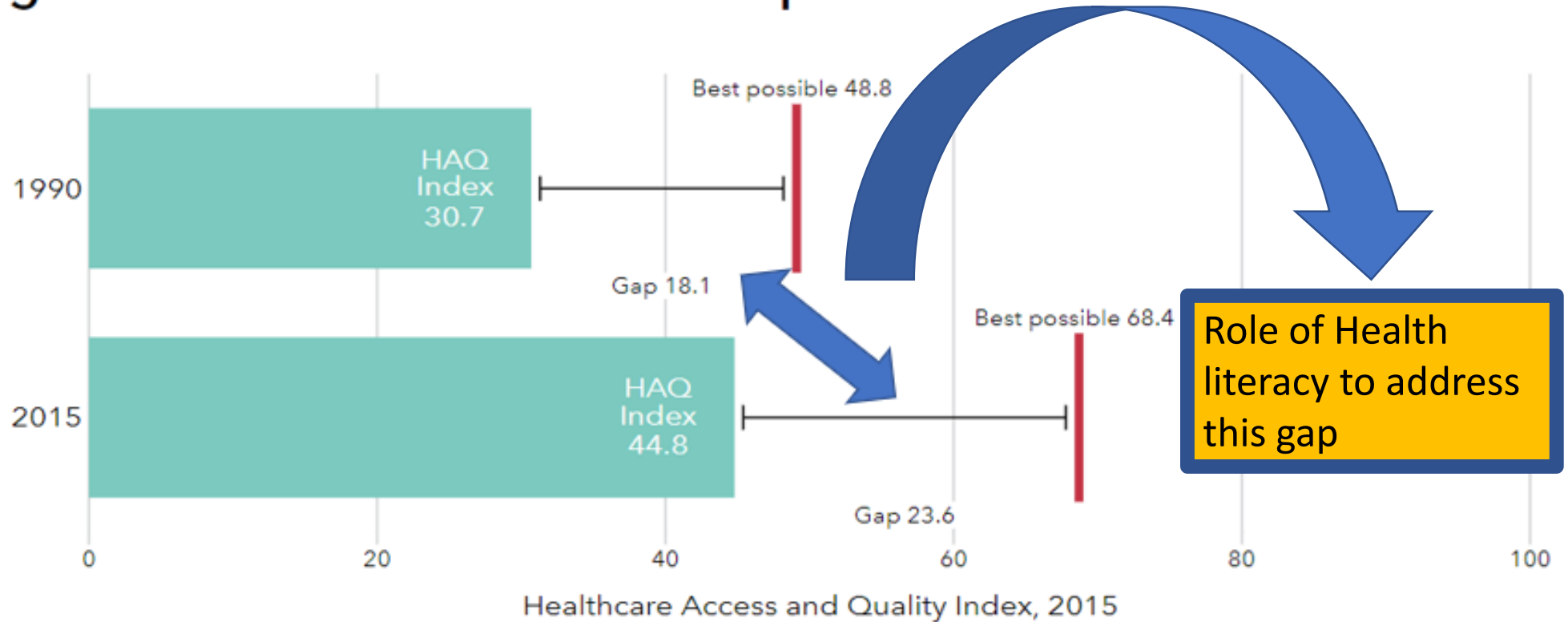
Disrupting the way we are delivering the health



7 billion
customers
is their playground

India

How does personal healthcare access and quality measure up against what is considered "best possible"?



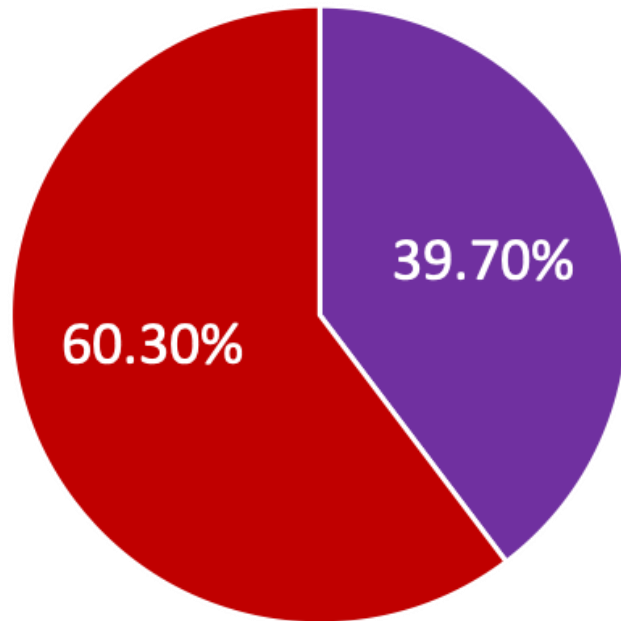
Source: bit.ly/amenable-mortality

The Healthcare Access and Quality (HAQ) Index provides a summary measure of personal healthcare access and quality on a scale from 0 (lowest) to 100 (highest). This measure is based on risk-standardized mortality rates from causes that, in the presence of high-quality healthcare, should not result in death.

Cross Sectional Survey: 500 Physicians and 500 Patients

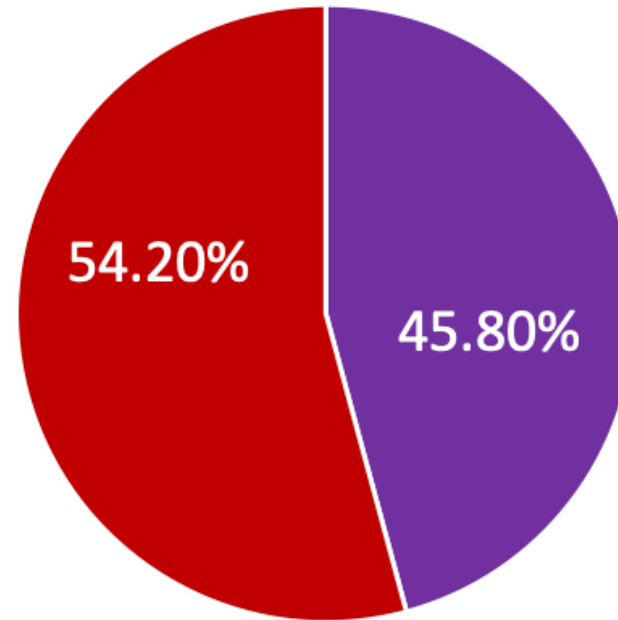
Demand Side (consumers)

Does your doctor ask about your living condition when you visit for a health issue?



■ Yes ■ No

Do you know the top five public health issues in your community?

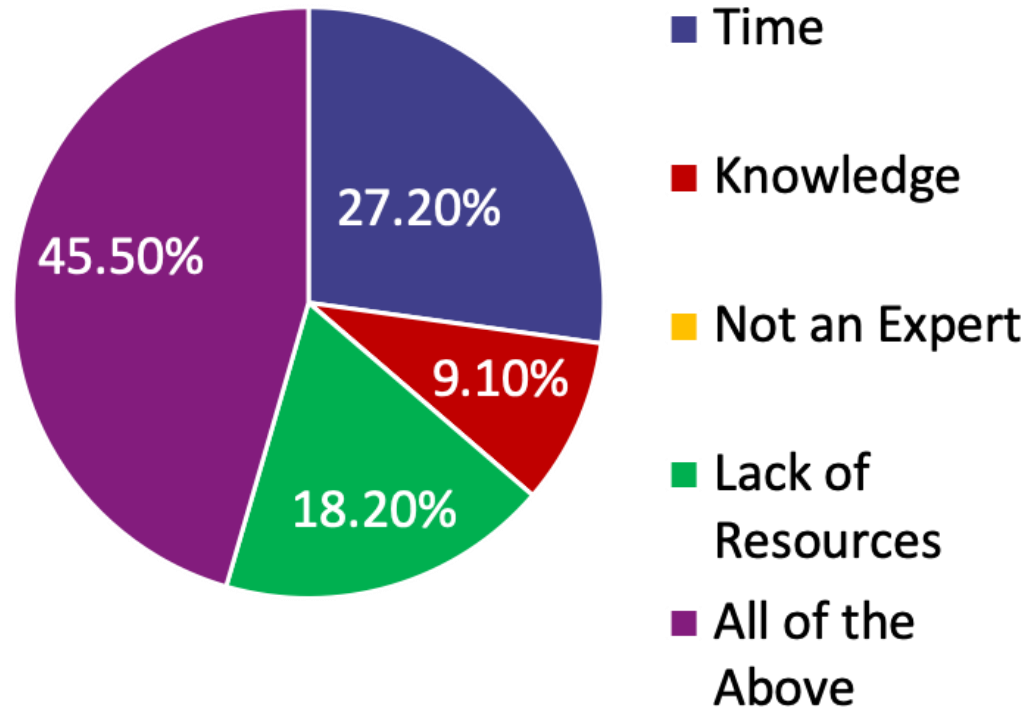


■ Yes ■ No

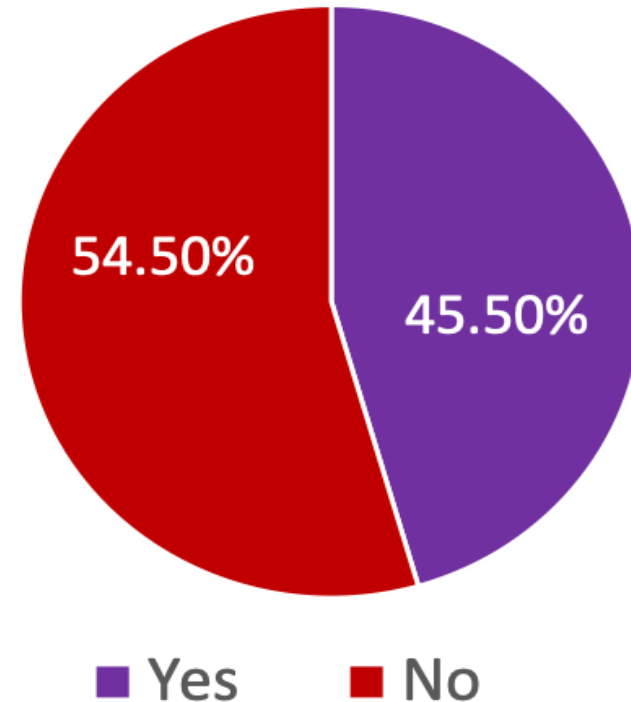
Cross Sectional Survey

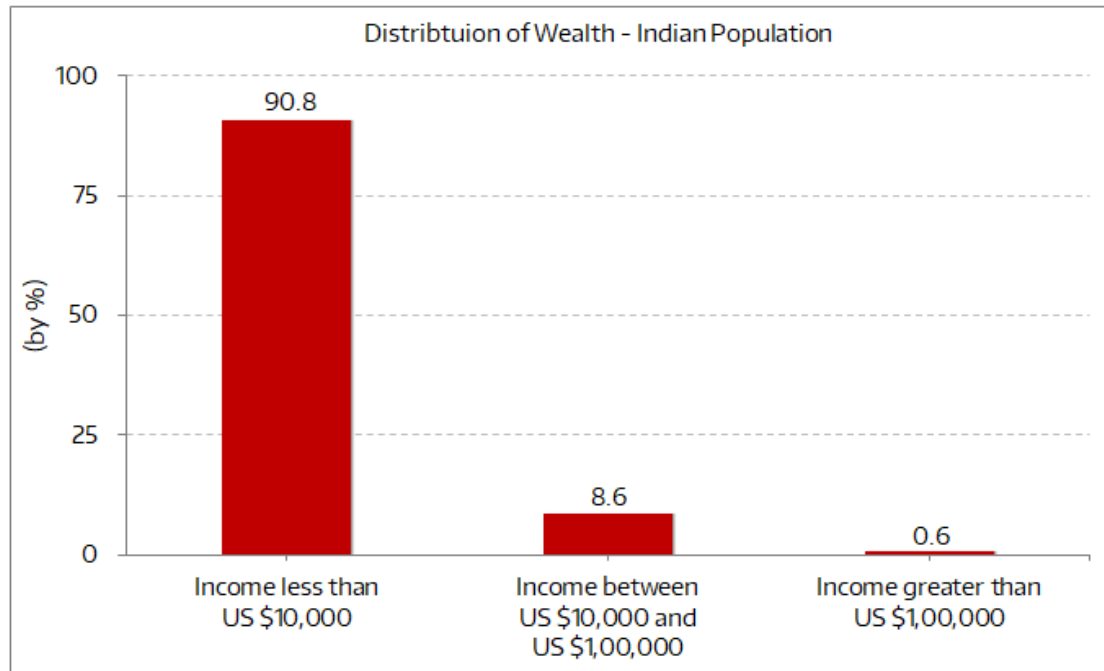
Supply Side (physicians)

What is the limiting factor to address socio-economical issues in your communities?



Does your practice allow you spend time to talk about social and economical factors that may be causing your patient health issues?





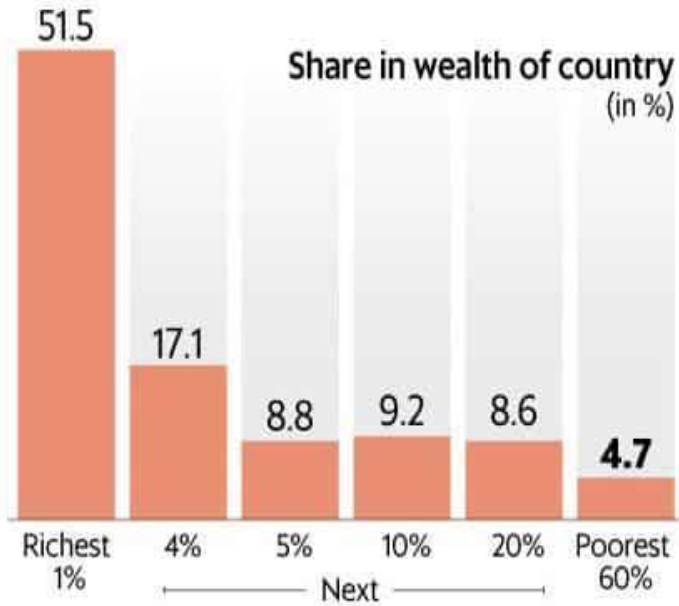
www.equitymaster.com

Data Source: Credit Suisse; Business standard

Chart 1

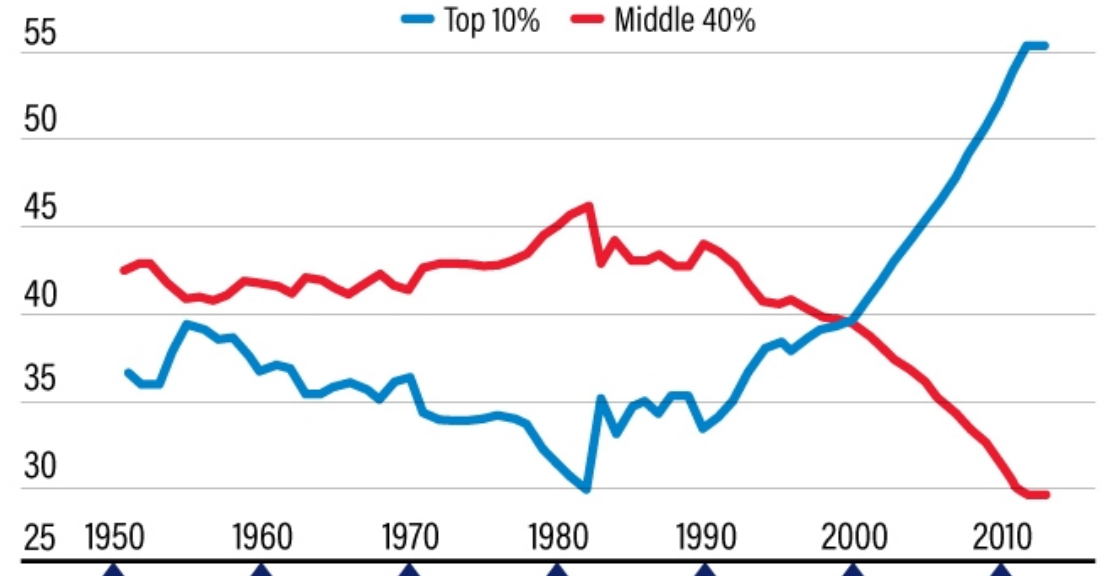
The Indian plutocracy

The richest 10% have 77.4% of national wealth; the poorest 60% have 4.7%.



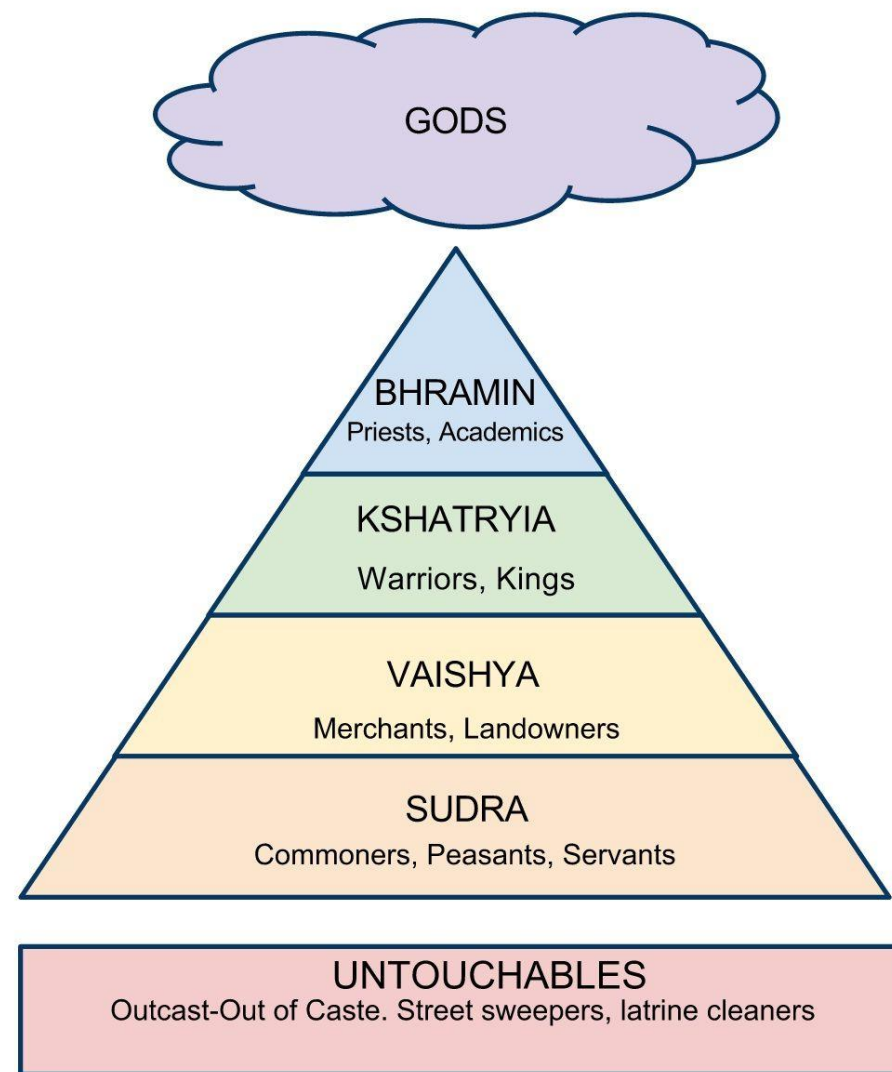
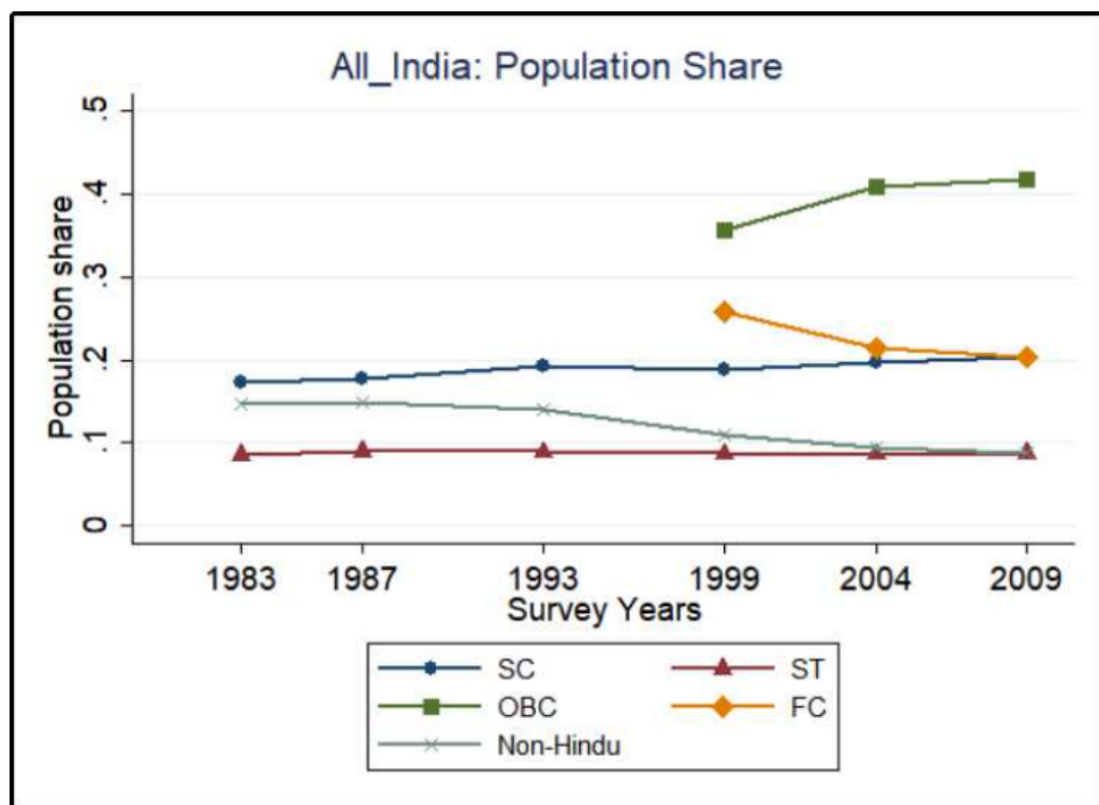
Source: Credit Suisse

India income share: Top 10% compared with middle 40% 1951-2014



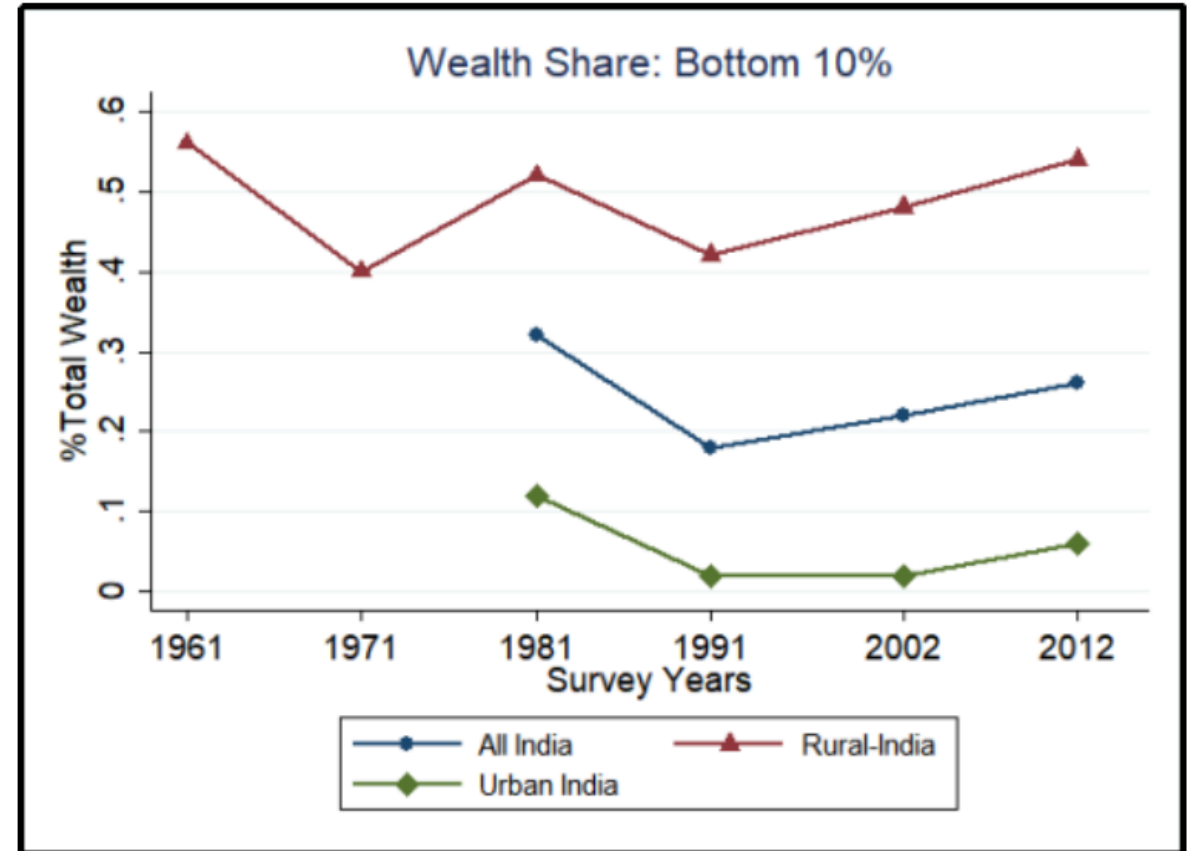
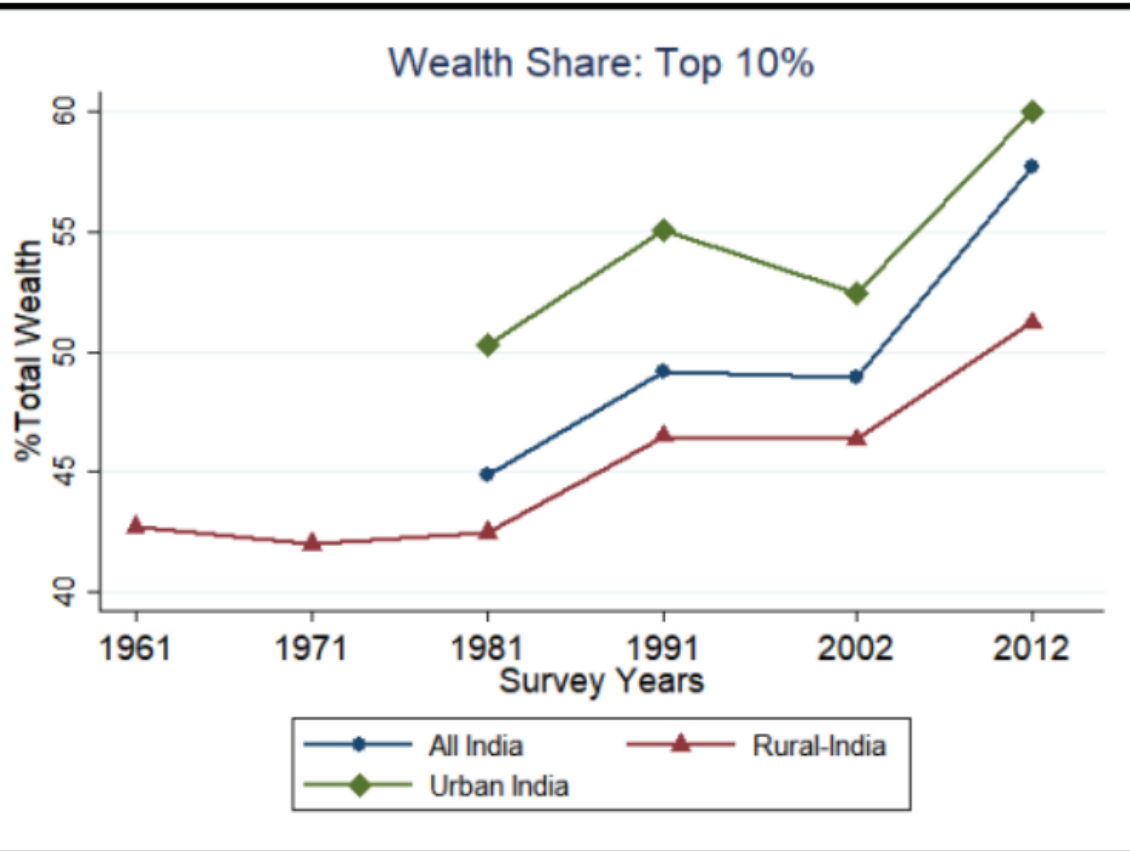
Source: wid.world

(a) Proportion of SC/ST/OBC/FC



(a) Top 10%

(b) Bottom 10%



Note: Author's calculation using NSS-AIDIS datasets and reports. Rural India series is from 1961. Urban India series information is available only from 1981.



Percentage of Land Area Ownership									
	Bottom 50 %			Middle 40%			Top 10%		
Year	1991	2002	2012	1991	2002	2012	1991	2002	2012
India	4.10	4.01	3.84	45.83	41.33	35.88	52.18	53.01	54.48
Rural	6.68	6.76	6.79	44.98	44.47	43.78	48.34	48.76	49.43
Urban	0.86	1.77	1.36	16.05	11.27	20.96	83.09	86.96	77.68

<https://wid.world/document/n-k-bharti-wealth-inequality-class-and-caste-in-india-1961-2012/>



Poverty and Public health – Missing “A” Acceptability

- Poverty is a result of systemic problems related to the social and justice systems in place that work to perpetuate their condition.
- “Poverty porn” (Just observe and feel overwhelmed) leads to charity, not activism: donors, not advocates.
- Empowering the poor to transform their own communities,
- Create avenues for *their* voices to be heard.
- We cannot impose our constructs on them

Emily Roenigk One.org

Access to Clean Water

Who owns the problem?



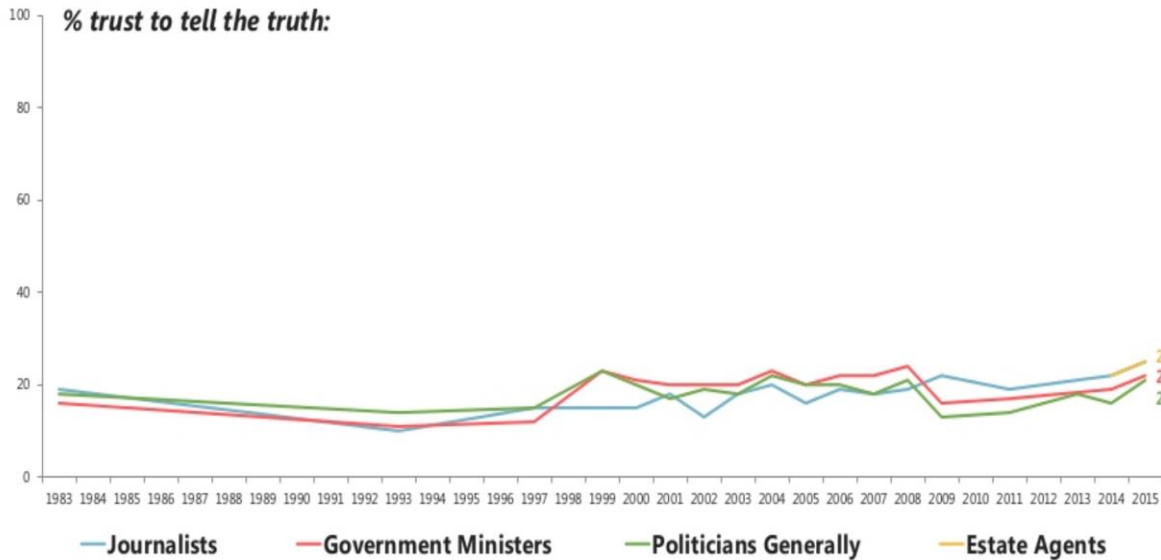
- 1.2 billion people are drinking unsafe water
- Problem:
 - transport (retrieval to consumption)
 - Infrastructure of residences city planning
 - Water department
 - Public health institutions
 - Poverty – Income distribution
 - Gender inequality

Acceptability is a function of

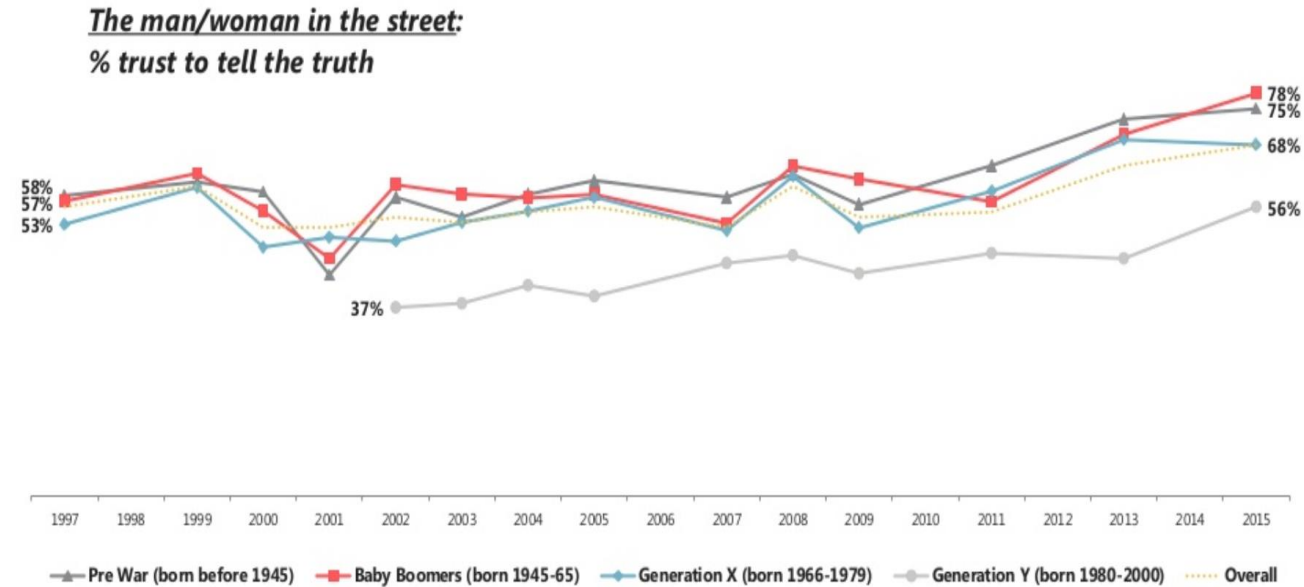
- Position in the societal strata (social determinants)
- Health literacy
- Trust in the society and political climate
- Culture norms
- poor economic models
- Leadership

Acceptability is a function of trust

Journalists, Government Ministers and politicians have been among the least trusted to tell the truth since 1983; this year they are as little trusted as Estate Agents

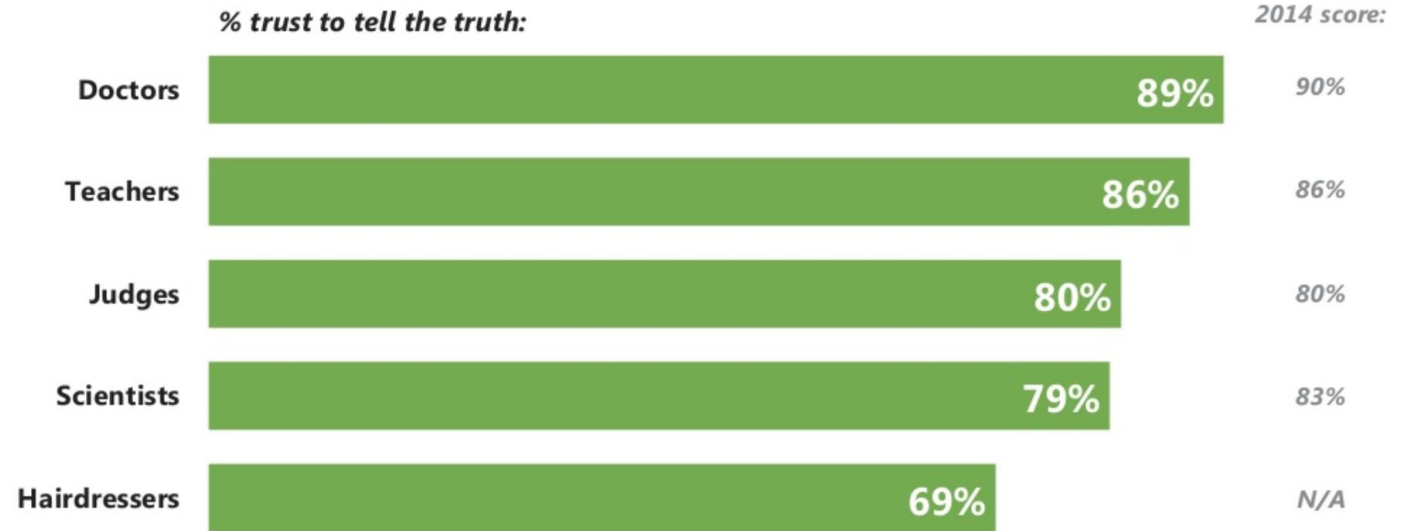


Generation Y remain notably less trusting of the man/woman in the street than previous generations, although trust has risen in all age groups...

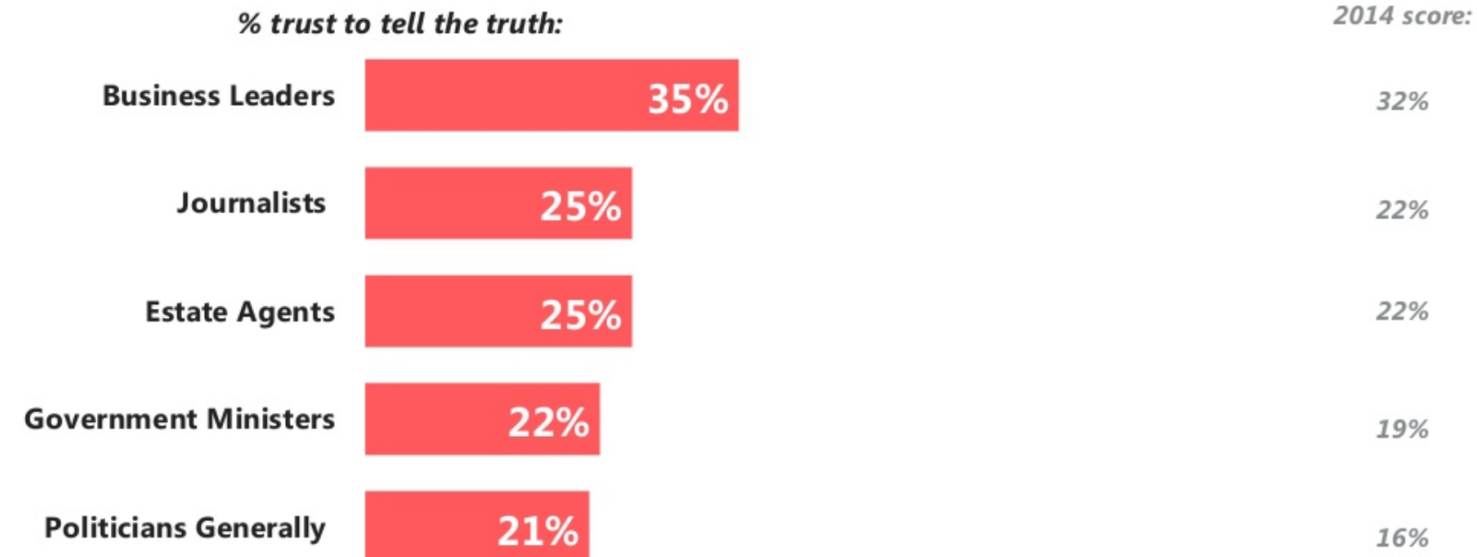


Trust is a health marker

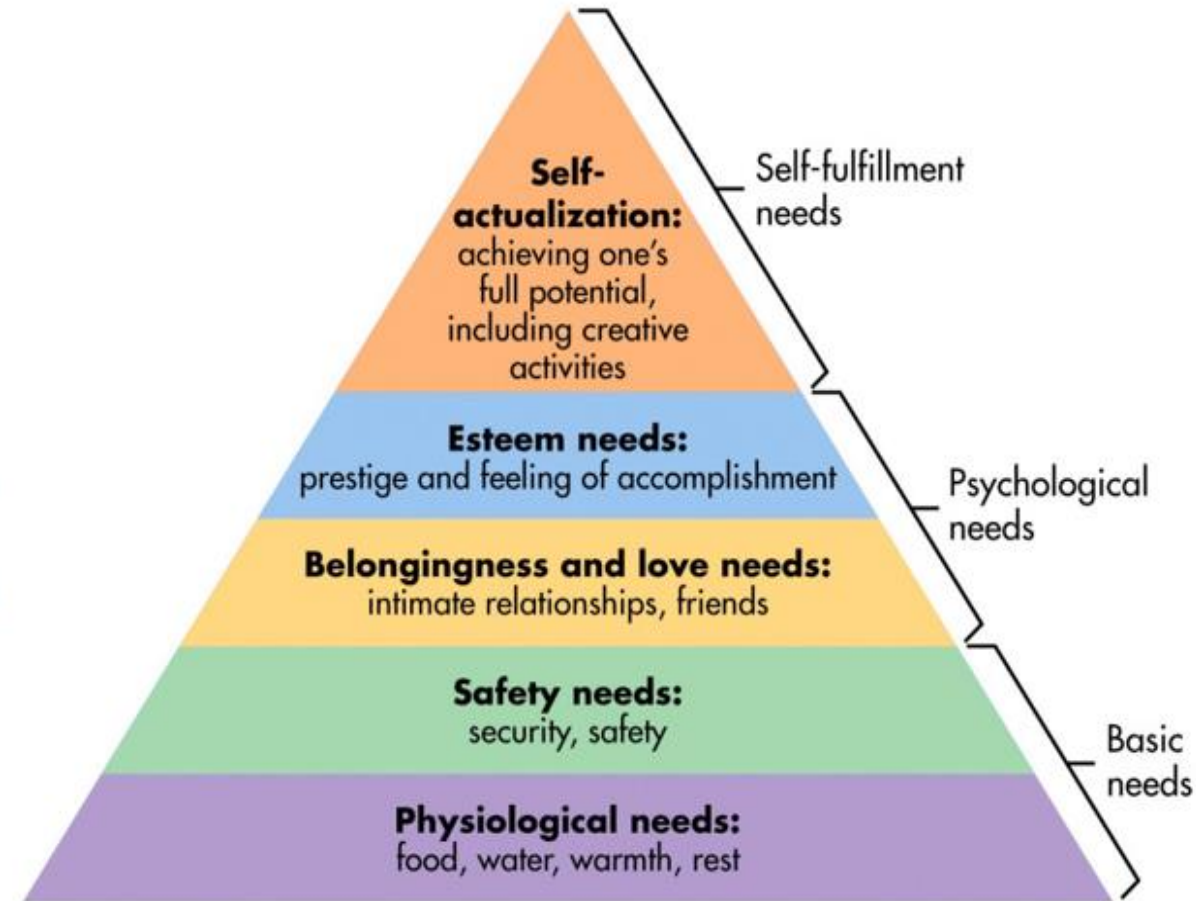
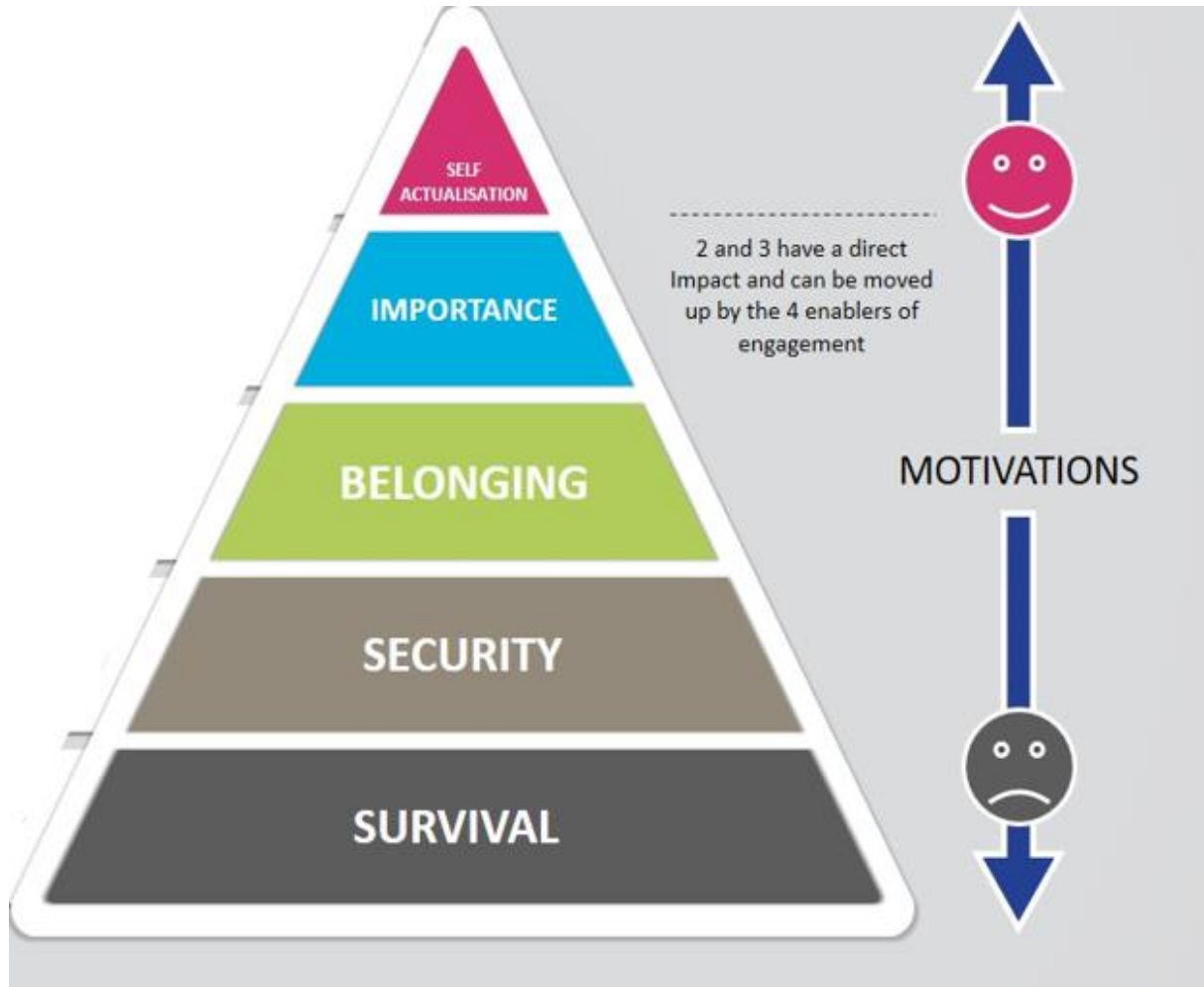
The five most trusted professions, 2015



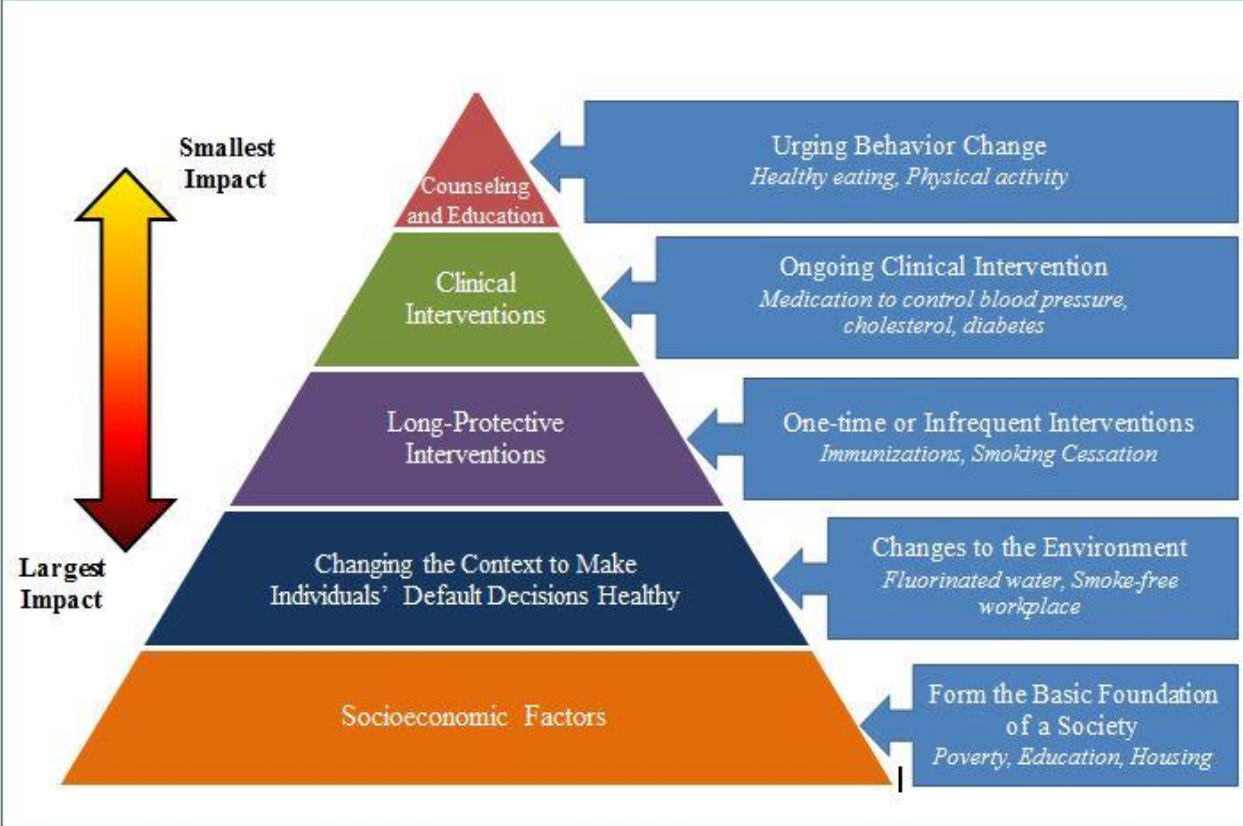
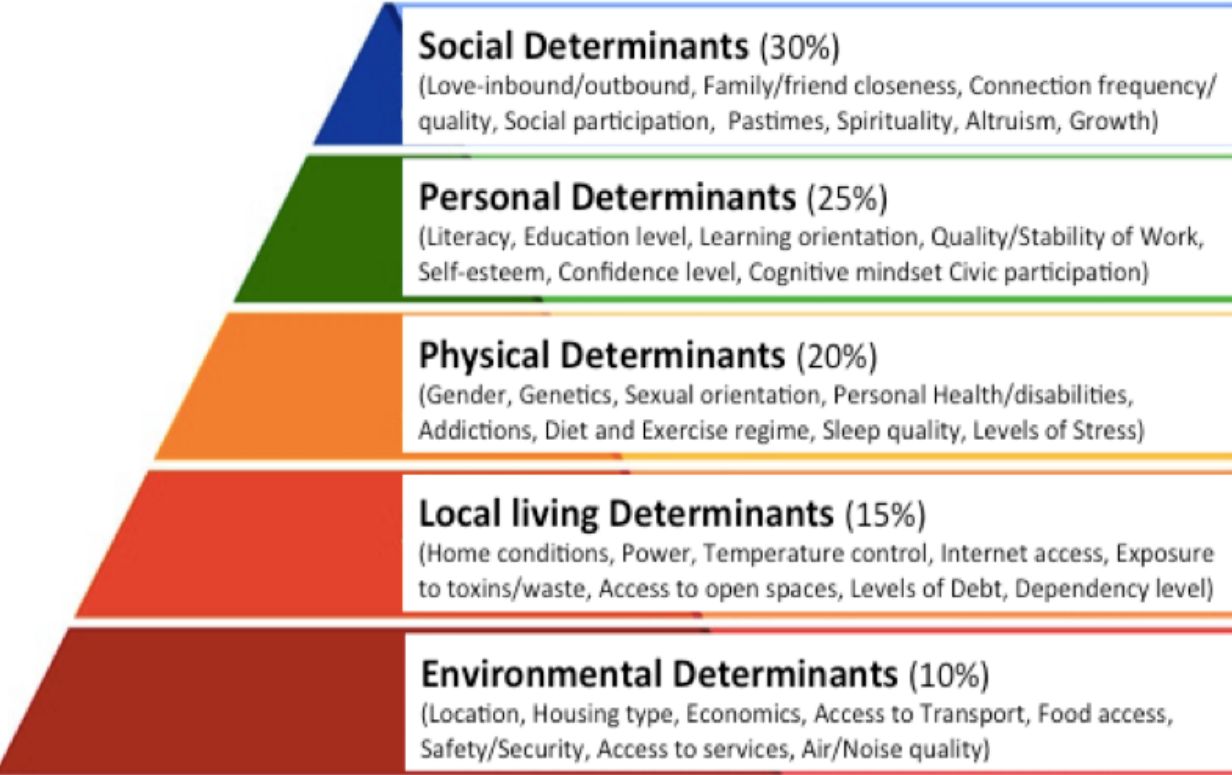
The five least trusted professions, 2015



What philanthropy does not get:



Warner's Determinants of Health and Happiness



Health inequality, Inequity and Disparity

Inequality: Lack of equality because of the status.

- Obese people suffer higher incidence of depression and heart condition than non-obese people

Inequity: Instance of unjustness or unfairness

- Obese people are discriminated at employment, in buses and trains, ignored to get good services in the bank or restaurant)

Disparity: Set of situations related to environment, access, outcomes as a whole. This is more avoidable and room of policy implication.

- What % of obese people are obese due to poverty, lack of healthy food in their town or expensive, or lack of safe streets to walk and exercise

Disparity offers the opportunity for high ROI (return of investment)

Democracy as a marker of Public health



The relationships between democratic experience, adult health, and cause-specific mortality in 170 countries between 1980 and 2016: an observational analysis



Thomas J Bollyky*, Tara Templin*, Matthew Cohen, Diana Schoder, Joseph L Dieleman, Simon Wigley

Lancet 2019; 393: 1628-40

Published Online

March 13, 2019

[http://dx.doi.org/10.1016/S0140-6736\(19\)30235-1](http://dx.doi.org/10.1016/S0140-6736(19)30235-1)

S0140-6736(19)30235-1

Summary

Background Previous analyses of democracy and population health have focused on broad measures, such as life expectancy at birth and child and infant mortality, and have shown some contradictory results. We used a panel of data spanning 170 countries to assess the association between democracy and cause-specific mortality and explore the pathways connecting democratic rule to health gains.

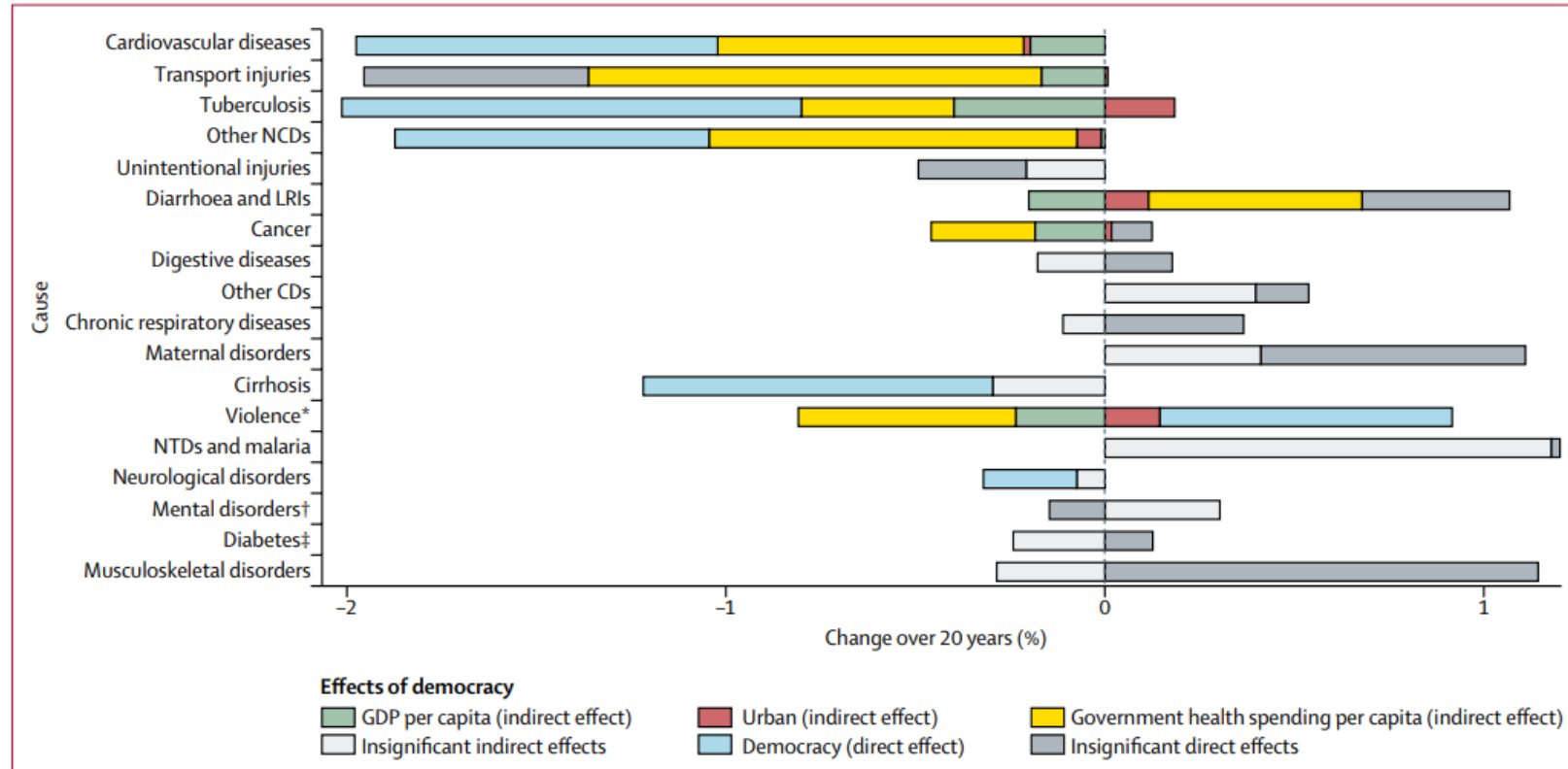


Figure 4: Long-term effect of democracy on country disease burden

The estimated direct and indirect long-term effects of democracy on health from a structural equation model. The blue bars show the direct effect of democratic change on changes in health. The green, red, and yellow bars show the indirect effects of democratic change on changes in health due to resulting changes in gross domestic product (GDP) per capita, urbanicity, and government health expenditure as source. All changes are from 1995 to 2015. Results that were not statistically significant are shown in grey. HIV/AIDS and forces were omitted because of distortion of the x-axis of the graph, such that the other causes were not visible; all results are available in the appendix. NCDs=non-communicable diseases. LRIs=lower respiratory and other common infectious diseases. CDs=communicable diseases. NTDs=neglected tropical diseases. *Includes self-harm and interpersonal violence. †Includes substance use disorders. ‡Includes diabetes, urogenital, blood, and endocrine diseases.

More to understand on novel social determinants



European Society
of Cardiology

European Heart Journal (2019) **40**, 1577–1580

doi:10.1093/eurheartj/ehz318

ISSUE @ A GLANCE

Novel cardiovascular risk factors: air pollution, air temperature, pain, and sleep duration



Thomas F. Lüscher^{1,2,3}, MD, FESC

¹Professor of Cardiology, Imperial College and Director of Research, Education & Development, Royal Brompton and Harefield Hospital Trust, London, UK; ²Professor and Chairman, Center for Molecular Cardiology, University of Zurich, Switzerland; and ³Editor-in-Chief, *European Heart Journal*, Editorial Office, Zurich Heart House, Hottingerstreet 14, 8032 Zurich, Switzerland

Sleep as a cardiovascular disease marker

NEIGHBORHOOD CHARACTERISTICS IN RELATION TO SLEEP TIMING AND QUALITY

<http://dx.doi.org/10.5665/sleep.3054>

Associations of Neighborhood Characteristics with Sleep Timing and Quality: The Multi-Ethnic Study of Atherosclerosis

Amy S. DeSantis, PhD¹; Ana V. Diez Roux, MD, PhD²; Kari Moore, MS²; Kelly G. Baron, PhD³; Mahasin S. Mujahid, PhD⁴; F. Javier Nieto, MD, PhD⁵

¹*Social Sciences and Humanities, Indian Institute of Technology Gandhinagar, Ahmedabad, GJ, India;* ²*Center for Social Epidemiology and Population Health, Department of Epidemiology, University of Michigan – Ann Arbor, Ann Arbor, MI;* ³*Department of Neurology, Feinberg School of Medicine, Northwestern University, Chicago, IL;* ⁴*Division of Epidemiology, School of Public Health, University of California Berkeley, Berkeley, CA;* ⁵*Department of Population Health Sciences, School of Medicine and Public Health, University of Wisconsin, Madison, WI*

Duration of sleep

Association of estimated sleep duration and naps with mortality and cardiovascular events: a study of 116 632 people from 21 countries

Chuangshi Wang, Shrikant I Bangdiwala, Sumathy Rangarajan, Scott A Lear, Khalid F AlHabib, Viswanathan Mohan, Koon Teo, Paul Poirier, Lap Ah TSE, Zhiguang Liu
... Show more

European Heart Journal, Volume 40, Issue 20, 21 May 2019, Pages 1620–1629,
<https://doi.org/10.1093/eurheartj/ehy695>

Conclusion

Estimated total sleep duration of 6–8 h per day is associated with the lowest risk of deaths and major cardiovascular events. Daytime napping is associated with increased risks of major cardiovascular events and deaths in those with >6 h of nighttime sleep but not in those sleeping ≤ 6 h/night.

Pain as a risk for CVDs

> Eur Heart J. 2019 May 21;40(20):1609-1617. doi: 10.1093/eurheartj/ehz111.

Widespread Pain Is a Risk Factor for Cardiovascular Mortality: Results From the Framingham Heart Study

Jonas Tesarz¹, Wolfgang Eich¹, David Baumeister¹, Thomas Kohlmann², Ralph D'Agostino³, Alexander K Schuster⁴

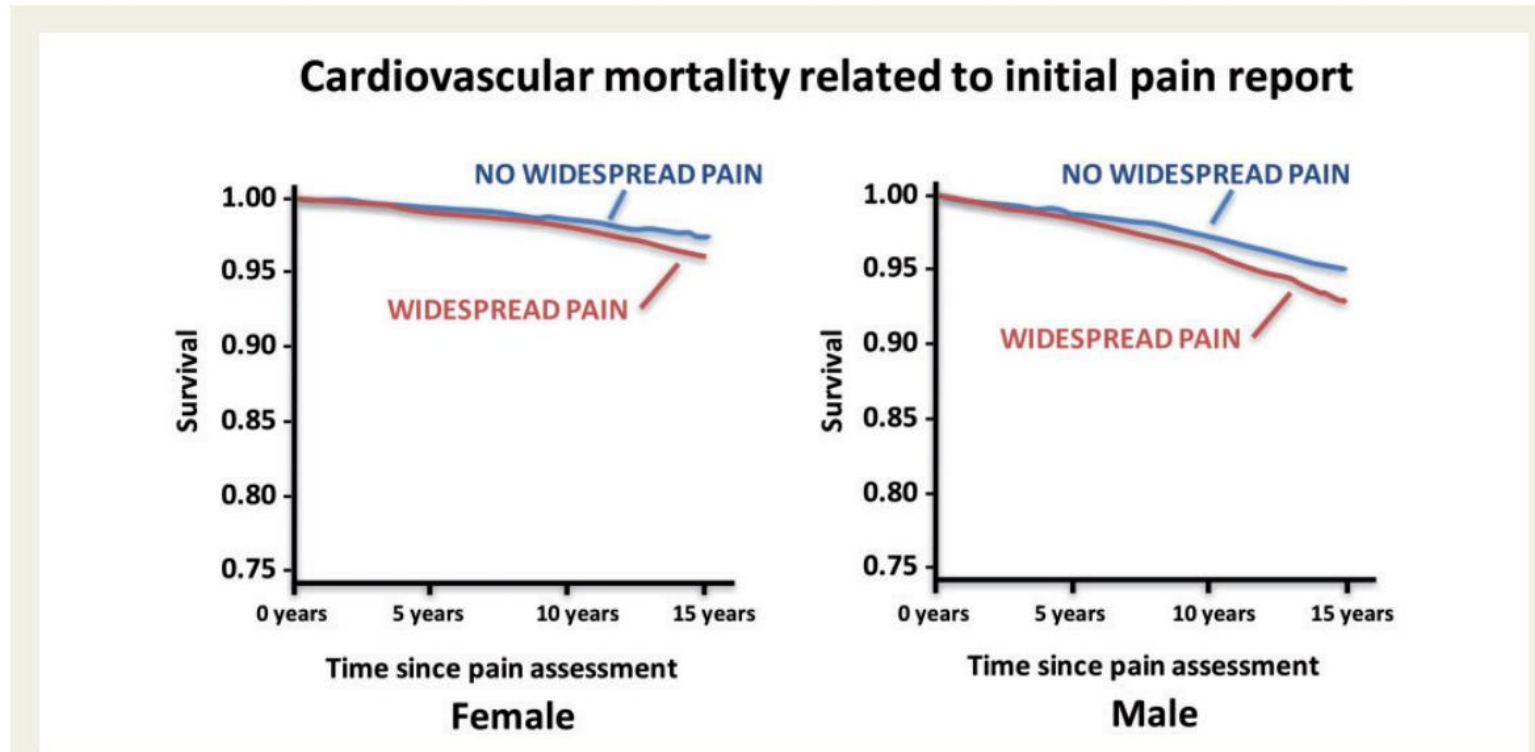


Figure 2 Cardiovascular mortality related to initial pain assessment in females and males. Survival curves adjusted for age during the observation period stratified by groups with no widespread pain (upper curve) and with widespread pain (lower curve). For both endpoints, the curves diverge continuously and significantly throughout the 15 years of follow-up (from Tesarz J, Eich W, Baumeister D, Kohlmann T, D'Agostino R, Schuster AK. Widespread pain is a risk factor for cardiovascular mortality: results from the Framingham Heart Study. See pages 1609–1617).

Air pollution as a risk for CVDs



European Society
of Cardiology

European Heart Journal (2019) **40**, 1590–1596
doi:10.1093/eurheartj/ehz135

FASTTRACK CLINICAL RESEARCH

Prevention and epidemiology

Cardiovascular disease burden from ambient air pollution in Europe reassessed using novel hazard ratio functions


**Jos Lelieveld^{1,2*}, Klaus Klingmüller¹, Andrea Pozzer¹, Ulrich Pöschl¹,
Mohammed Fnais³, Andreas Daiber^{4,5}, and Thomas Münzel^{4,5*}**

¹Max Planck Institute for Chemistry, Hahn-Meitner-Weg 1, 55128 Mainz, Germany; ²The Cyprus Institute, 20 Kavafi Street, 2123 Nicosia, Cyprus; ³King Saud University, College of Science, Riyadh 11451, Saudi Arabia; ⁴Center for Cardiology, Cardiology I, Angiology and Intensive Care Medicine, University Medical Center of the Johannes Gutenberg University, Langenbeckstrasse 1, 55131 Mainz, Germany; and ⁵German Center for Cardiovascular Research (DZHK), Partner Site Rhine-Main, Langenbeckstr. 1, 55131 Mainz, Germany

Hours of working and shifts of working hours as risk factor for CVDs

ORIGINAL ARTICLES

Dose–Response Relation Between Work Hours and Cardiovascular Disease Risk Findings From the Panel Study of Income Dynamics

Conway, Sadie H. PhD; Pompeii, Lisa A. PhD; Roberts, Robert E. PhD; Follis, Jack L. PhD; Gimeno, David PhD [Author Information](#) 

Journal of Occupational and Environmental Medicine: March 2016 - Volume 58 - Issue 3 - p 221-226
doi: 10.1097/JOM.0000000000000654

Results:

A dose–response relationship was observed in which an average workweek of 46 hours or more for at least 10 years was associated with an increased risk of CVD. Compared with working 45 hours per week, working an additional 10 hours per week or more for at least 10 years increased CVD risk by at least 16%.

Science News

from research organizations

Women's long work hours linked to alarming increases in cancer, heart disease

Study links overtime to early development of chronic, life-threatening illness

Date: June 16, 2016

Source: Ohio State University

Summary: Women who put in long hours for the bulk of their careers may pay a steep price: life-threatening illnesses, including heart disease and cancer. Work weeks that averaged 60 hours or more over three decades appear to triple the risk of diabetes, cancer, heart trouble and arthritis for women, according to new research.

ORIGINAL ARTICLES

Shiftwork and Biomarkers of Subclinical Cardiovascular Disease The BCOPS Study

Holst, Meghan M. MSPH; Wirth, Michael D. MSPH, PhD; Mnatsakanova, Anna MS; Burch, James B. PhD; Charles, Luenda E. PhD; Tinney-Zara, Cathy MPH; Fekedulegn, Desta PhD; Andrew, Michael E. PhD; Hartley, Tara A. PhD; Violanti, John M. PhD [Author Information](#) 

Journal of Occupational and Environmental Medicine: May 2019 - Volume 61 - Issue 5 - p 391-396
doi: 10.1097/JOM.0000000000001541

Results:

Associations were observed between day and night shiftworkers for leukocytes, tumor necrosis factor alpha, and homocysteine. After BMI stratification, higher c-reactive protein (CRP) levels were observed among evening shiftworkers with a BMI more than or equal to 30 kg/m² versus the day shift.

Emotion Health (Note is not same as mental health)

The Impact of Emotions on Cardiovascular Health

R Williams ¹, J Kiecolt-Glaser, M J Legato, D Ornish, L H Powell, S L Syme, V Williams

Affiliations — collapse

Affiliation

¹ Behavioral Medicine Research Center, Department of Psychiatry, Duke University Medical Center, Durham, NC, USA.


PMID: 11252836

Abstract

Recent research suggests that the maintenance of emotional well-being is critical to cardiovascular health. People who feel lonely, depressed, and isolated have been found to be significantly more likely to suffer illnesses and to die prematurely of cardiovascular diseases than those who have adequate social support.

ORIGINAL ARTICLES

Emotional Stress and Heart Rate Variability Measures Associated With Cardiovascular Risk in Relocated Katrina Survivors

Tucker, Phebe MD; Pfefferbaum, Betty MD, JD; Jeon-Slaughter, Haekyung PhD; Khan, Qaiser MPH; Garton, Theresa MD [Author Information](#) 

Psychosomatic Medicine: February/March 2012 - Volume 74 - Issue 2 - p 160-168
doi: 10.1097/PSY.0b013e318240a801

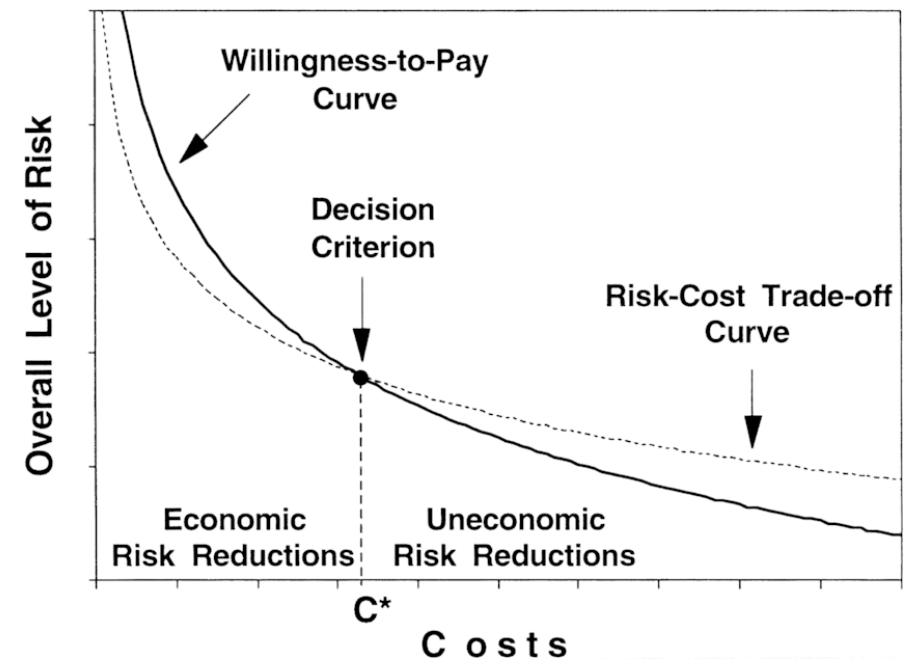
Mental Health as a risk factor for CVDs

Translational research

*The intriguing relationship between coronary
heart disease and mental disorders*

Marc De Hert, MD, PhD; Johan Detraux, MPsy; Davy Vancampfort, PhD

Economic affordability is always influenced by psychological acceptability

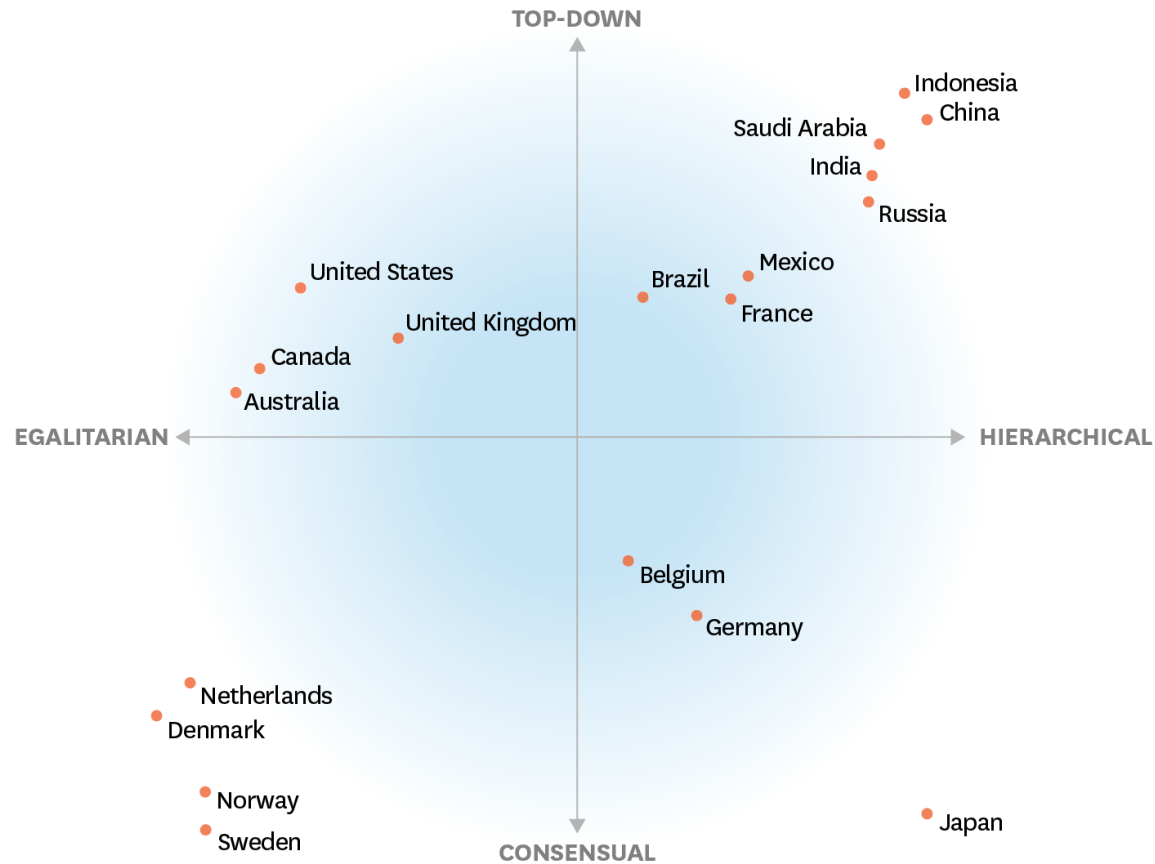


- Economic affordability refers to whether the potential customers in the target market have sufficient economic resources to pay a product's price.
- Psychological affordability refers to a customer's **willingness to pay**, which is primarily determined by a customer's perception of the value he or she will obtain from a product or service relative to the cost of the product or service
- Acceptability is prerequisite for Willingness to pay (WTP).

Leadership in leading cultures and word of caution

Mapping Leadership Cultures

Attitudes toward decision making can range along a continuum from strongly top-down to strongly consensual; attitudes toward authority can vary from extremely egalitarian to extremely hierarchical. The positions for the 19 countries shown on this map were determined from interviews conducted between 2003 and 2016.



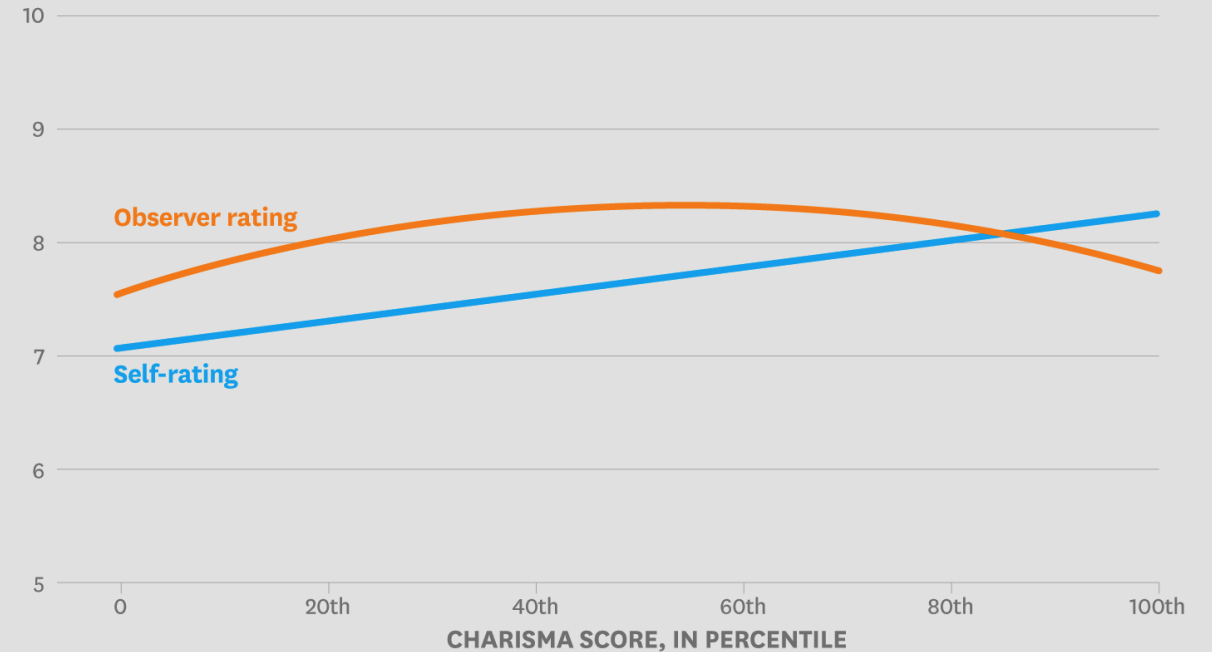
SOURCE "BEING THE BOSS IN BRUSSELS, BOSTON, AND BEIJING," BY ERIN MEYER, JULY-AUGUST 2017

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Being Too Charismatic Can Hurt Leaders' Perceived Effectiveness

While people who rate themselves as highly charismatic also say they're effective leaders, outside observers feel differently.

OVERALL LEADER EFFECTIVENESS RATING, ON A SCALE OF 1-10



SOURCE "THE DOUBLE-EDGED SWORD OF LEADER CHARISMA: UNDERSTANDING THE CURVILINEAR RELATIONSHIP BETWEEN CHARISMATIC PERSONALITY AND LEADER EFFECTIVENESS," BY J. VERGAUWE ET AL., JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY, 2017

FROM "TOO MUCH CHARISMA CAN MAKE LEADERS LOOK LESS EFFECTIVE," BY JASMINE VERGAUWE ET AL., SEPTEMBER 2017

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Desired Outcome



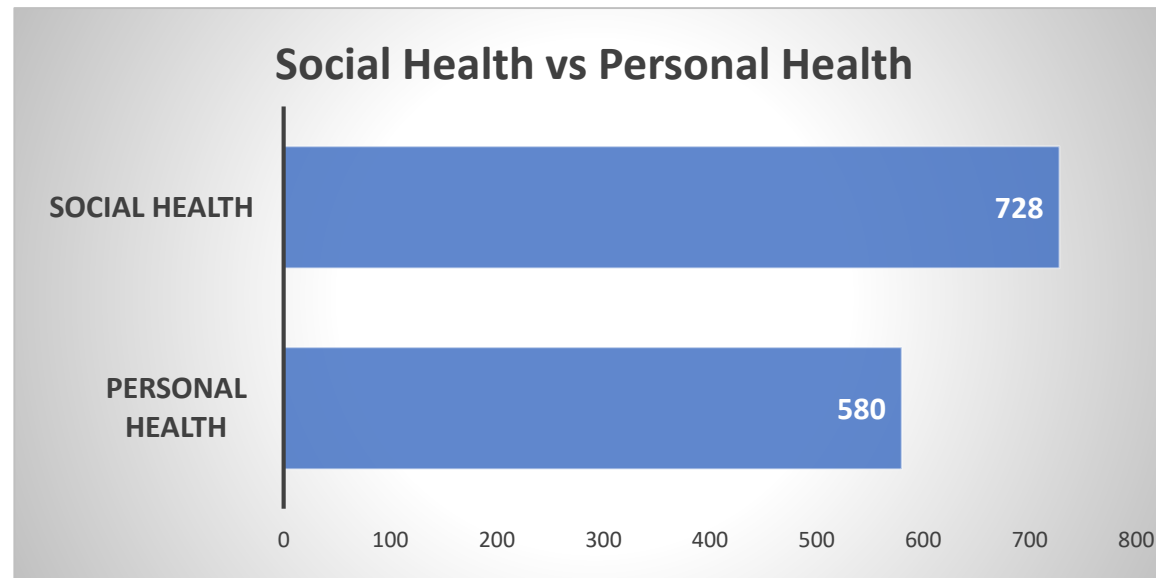
- Primary:

www.publichealthliteracy.org : **Informs** underlying systemic causes such as knowledge of housing condition, neighborhood effects, socio economical determinants and their relationship to various health issues

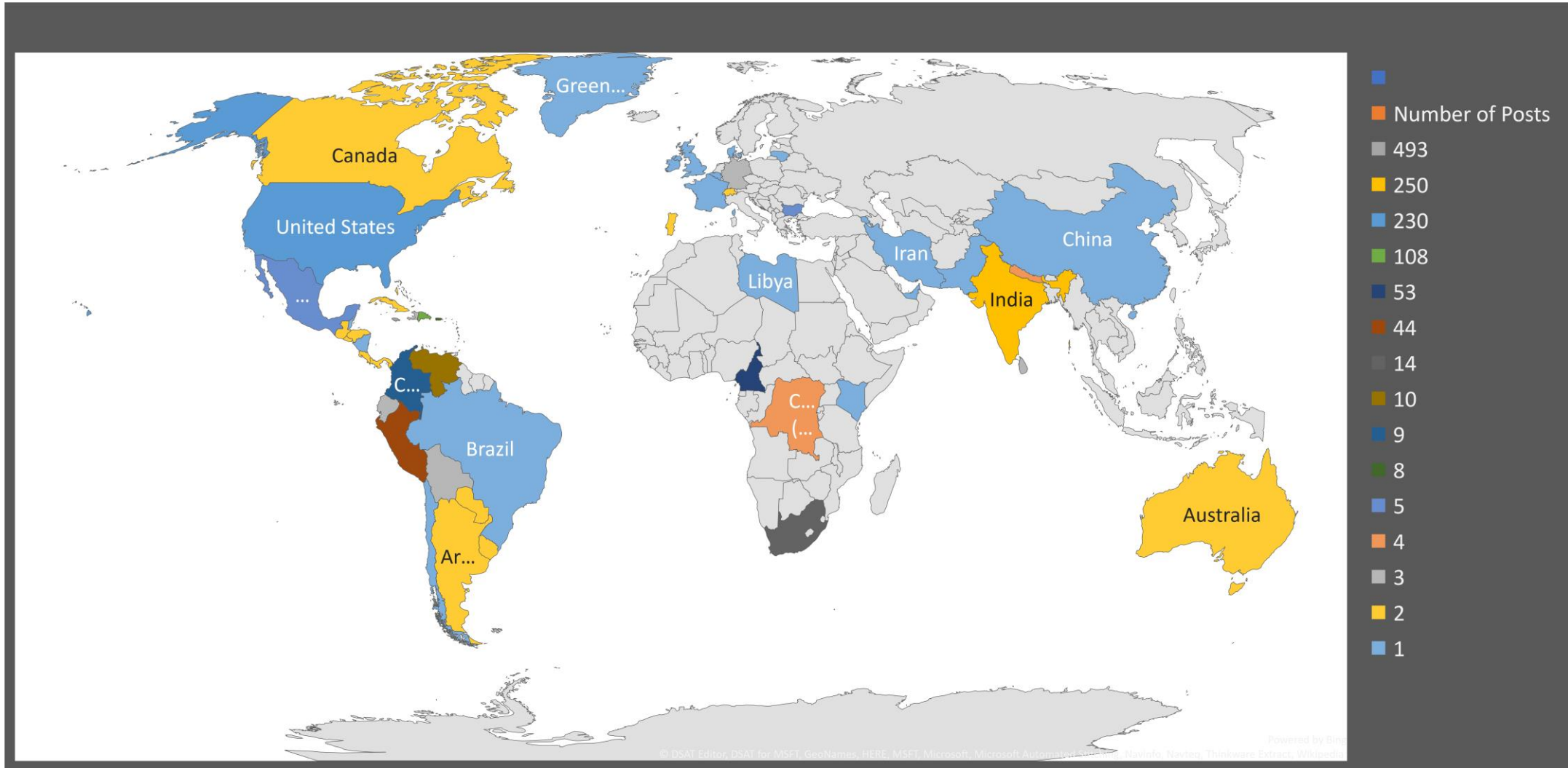
- Secondary:

www.publichealthliteracy.org: **Improves** community health, social equity and reduced healthcare cost.

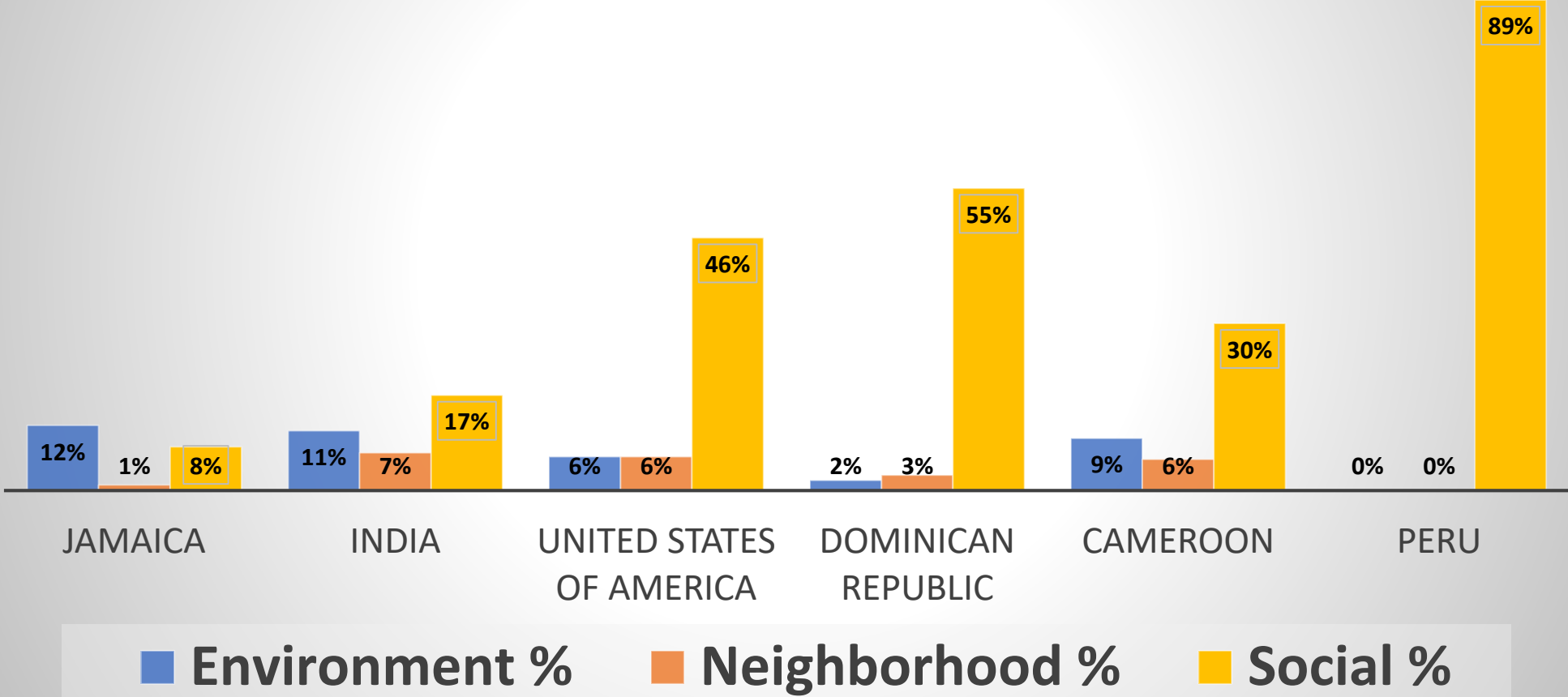
Product: The Platform



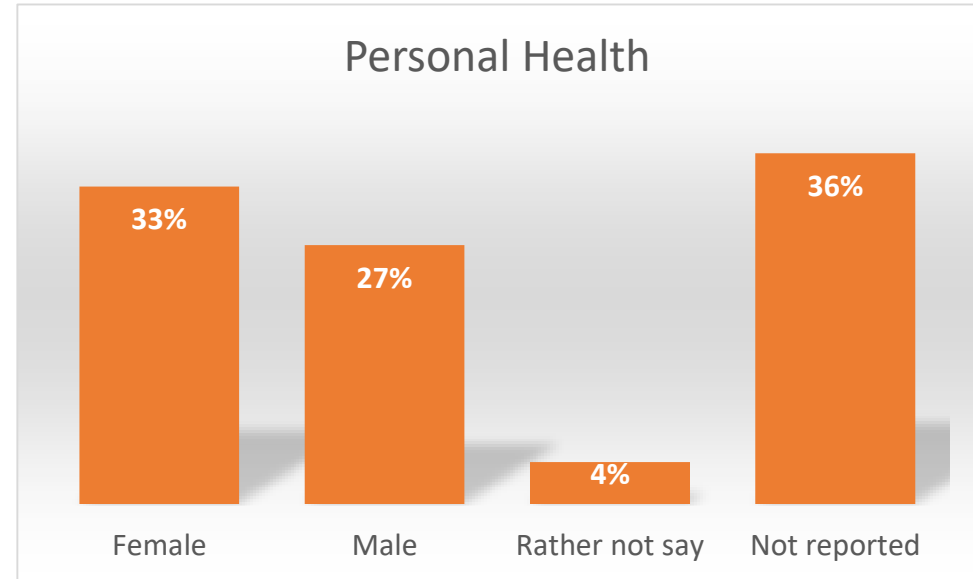
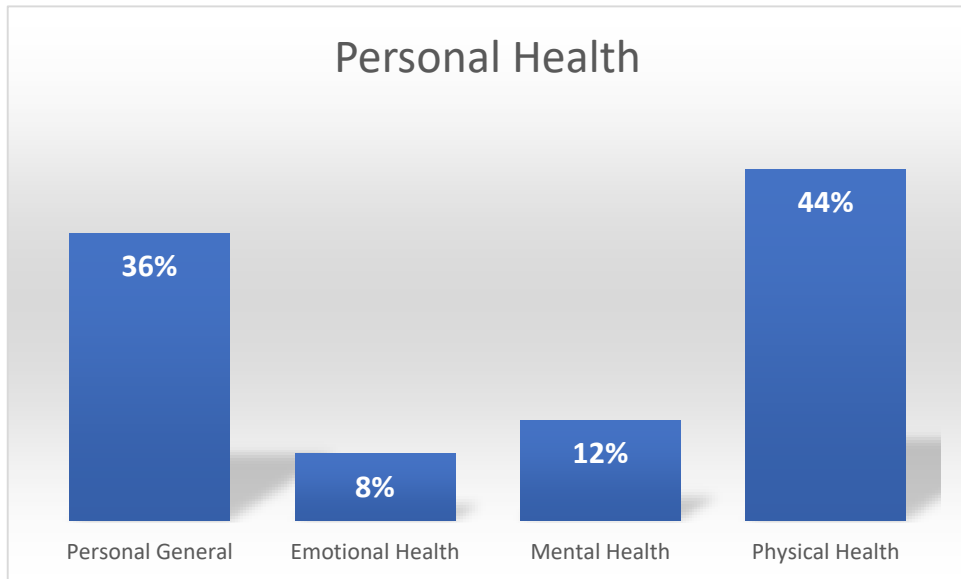
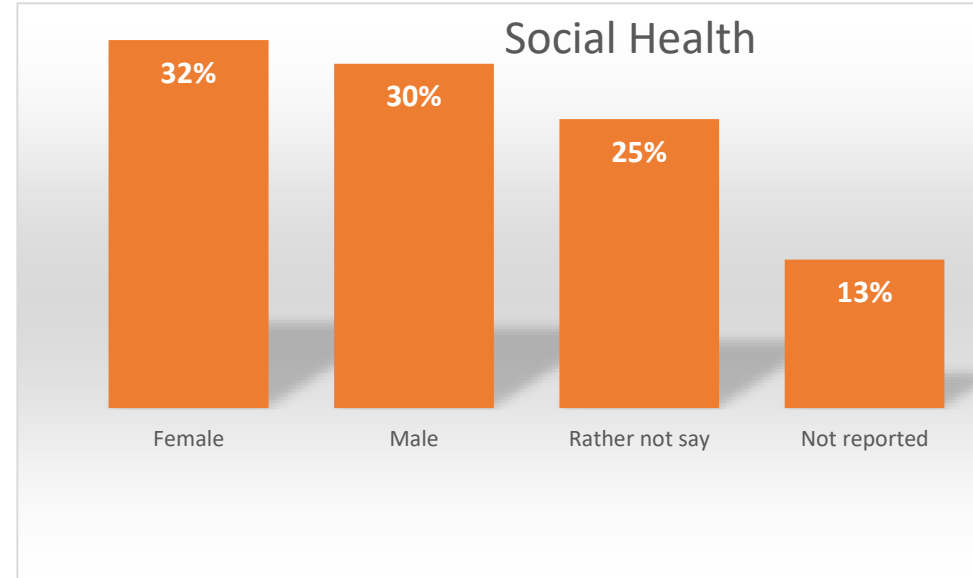
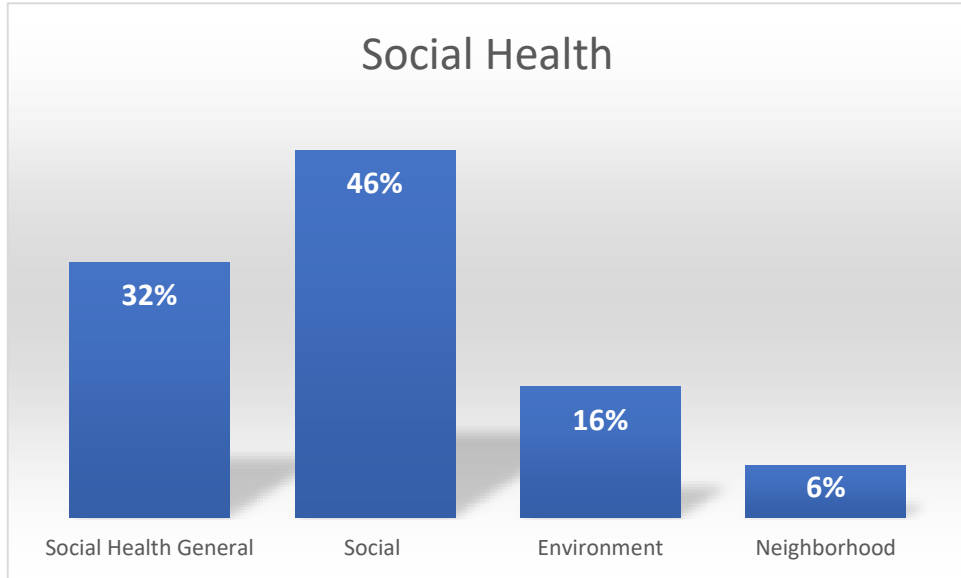
Early data: Preliminary – global trends



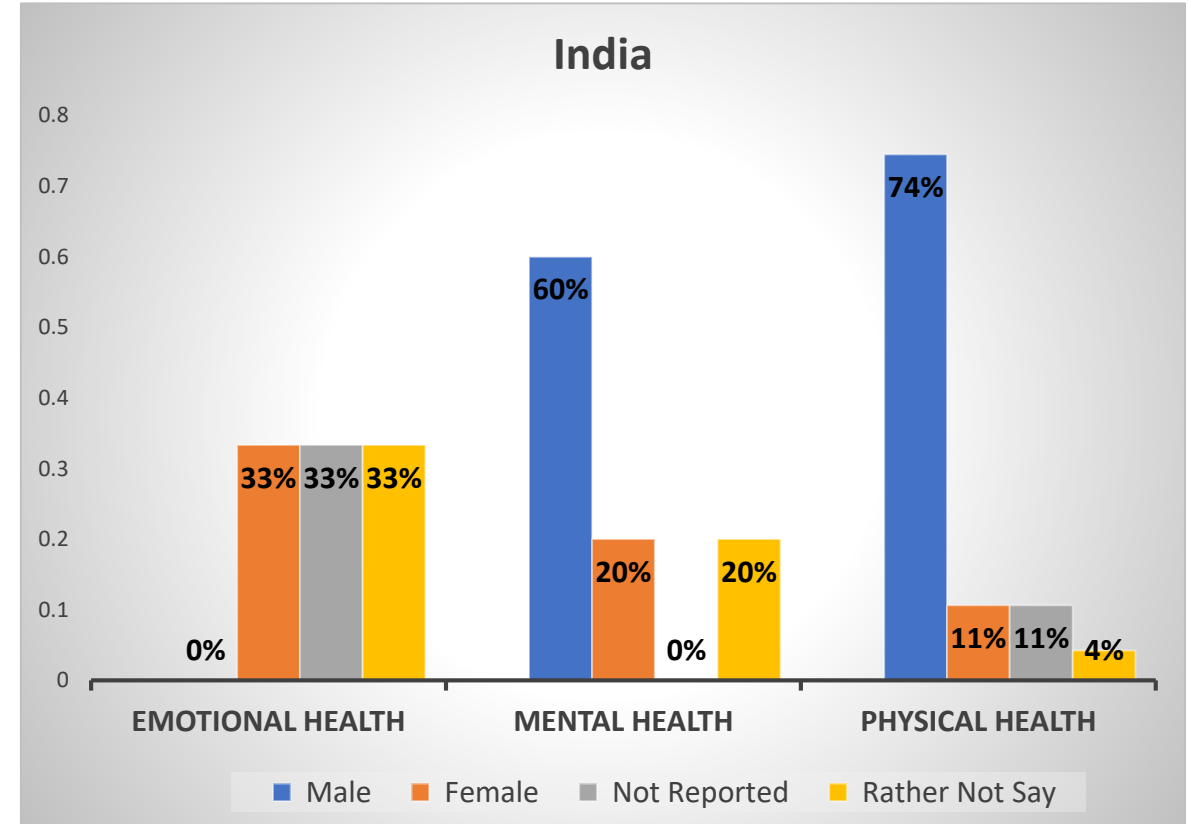
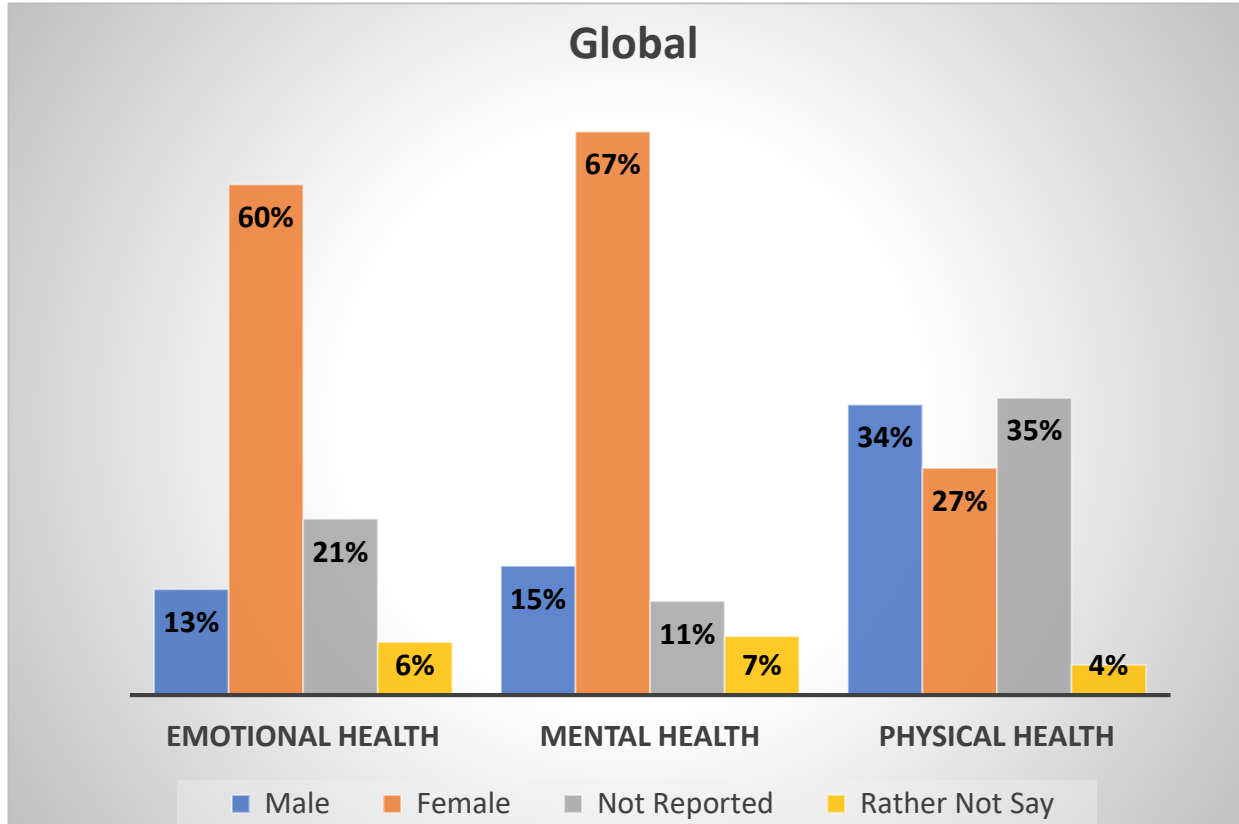
Social Health by country



Early data: By category and Gender: Global



Global vs regional trends: Personal health





The 3rd ICOPH-TCD 2020
The 3rd International Conference on Public Health
for Tropical and Coastal Development



ABSTRACT BOOK

the 3rd
ICOPH-TCD
2020

**The 3rd International Conference on Public Health
for Tropical and Coastal Development (ICOPH-TCD)**

**“Lifestyle and Environmental Changes:
Challenges on Public Health in Tropical and Coastal Areas
to Support SDG’s Achievements”**

**September, 29 - 30th, 2020
Semarang, Indonesia**

Health risk perception of COVID-19 in Caribbean countries

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Literacy, Jamaica, WI

⁴Faculty of Public Health, Diponegoro University, Indonesia

*Corresponding author: nprasad@publichealthliteracy.org

Abstract

Findings

- The differences in the risk perception indicates variation in social and cultural norms in each country.
- Cultural and geographic diversity such as personal experience, education, ideology, trust and values, influence people knowledge and understanding about the risks.
- The population perceives the health risk both in terms of real damage and perceived threat.